Technical training.
Product information.

G12 Introduction

Edited for the U.S. market by:
BMW Group University
Technical Training
ST1501 8/1/2015

BMW Service

General information

Symbols used

The following symbol is used in this document to facilitate better comprehension or to draw attention to very important information:

Contains important safety information and information that needs to be observed strictly in order to guarantee the smooth operation of the system.

Information status and national-market versions

BMW Group vehicles meet the requirements of the highest safety and quality standards. Changes in requirements for environmental protection, customer benefits and design render necessary continuous development of systems and components. Consequently, there may be discrepancies between the contents of this document and the vehicles available in the training course.

This document basically relates to the European version of left-hand drive vehicles. Some operating elements or components are arranged differently in right-hand drive vehicles than shown in the graphics in this document. Further differences may arise as the result of the equipment specification in specific markets or countries.

Additional sources of information

Further information on the individual topics can be found in the following:

- Owner's Handbook
- Integrated Service Technical Application.

Contact: conceptinfo@bmw.de

The information contained in this document forms an integral part of the technical training of the BMW Group and is intended for the trainer and participants in the seminar. Refer to the latest relevant information systems of the BMW Group for any changes/additions to the technical data.

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G12 Introduction

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1. Introduction

The 6th generation of the BMW 7 Series code named G12 is now being launched on the market. The new BMW 7 Series is also a technology pioneer. In other words, it features a host of new technologies and further developed design elements.

The closed radiator grille and the precise contours of the hood lend the front of the new BMW 7 Series a sporty character at first glance. The elegant lines of the side view are emphasized by the distinctive double crease and the highlighted Hofmeister kink. The chrome trim strips at the rear and the L shape of the rear lights round off the striking and confident appearance of the new BMW 7 Series.

The luxurious interior of the new BMW 7 Series is characterized by the quality craftsmanship at a supreme level, precise surfaces and a completely new feeling of spaciousness. This is complemented by technical highlights such as Ambient light and BMW Touch Command. But it is the seating comfort in particular that sets new standards in this vehicle class.

A particular technical highlight of the body is the body structure with carbon reinforcements. This is based on technology transfer from development of the BMW i vehicles. Use of carbon with its specific material properties increases torsional rigidity and strength. The weight is reduced at the same time.

1.1. History

E23

E23

The E23 is the first BMW 7 Series and was produced from 1977 to 1986.

The passenger cell has a dynamic appearance due to the pronounced slope of the A-pillar and smooth roofline transition to the rear. This lends the E23 a sporty yet elegant look.

In the interior, the instrument panel is turned towards the driver, making the operating elements easier to reach. This ergonomically optimum driver orientation has become a design feature that is typical for BMW.

The E23 was initially produced in the works in Munich and Dingolfing. As from December 1982, the E23 rolled off the assembly line only in Dingolfing, like all subsequent BMW 7 series models.

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1. Introduction

E32

E32

The E32 was produced from 1986 to 1994.

The harmonious contours and flowing transitions at the front, side and rear provide the E32 with a particularly elegant look. The horizontally wider radiator grill reinforces the presence of the front end. The L-shaped rear lights form the basis of an important BMW design element.

The E32 was also the first BMW 7 Series to be offered as a long version – with a 11.4 cm / 4.5 inch longer body.

E38

E38

The E38 was produced from 1994 to 2001.

Thanks to its elegant lines, the 3rd generation of the BMW 7 Series has a more elegant and elongated appearance than its predecessor.

Particular attention is paid to the rear seat passengers through a host of equipment and design details.

In addition to the "normal" long version (wheelbase extended by 14 cm / 5.5 inches), the E38 was also produced in a version with a 39 cm / 15.3 inch-longer wheelbase as the “L7”.

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1. Introduction

E65/E66

E65

The E65 was produced from 2001 to 2008 (LCI: 2005 to 2008).

BMW opened up a completely new design era with the E65. The front end preserves the typical BMW radiator grille and twin circular headlights. The front headlights extend elegantly into the side contours. The side contour exudes calm and elegance thanks to the single continuous line extending from the front through to the complete rear end. The roofline has a Coupé-like form.

The greatest revolution in the vehicle interior is the iDrive operating system. This system made it possible to dispense with a large number of buttons, making the driving area appear much tidier and clearer.

The E66 is the long version of the E65 and was therefore given its own development code for the first time.

F01/F02

F01

The F01/F02 was produced from 2008 to 2015 (LCI: from 2012).

The 5th generation of the BMW 7 Series creates an even stronger presence through its large air inlets and long hood. At the sides, the balanced proportions are elegantly extended by longitudinal lines and surfaces. The width of the rear area is emphasized to convey the vehicle's sporting character.

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1. Introduction

A special feature in the vehicle interior is the so-called “Black Panel“ in the instrument panel. The displays and indicator lights in the instrument cluster are now located behind a matt-black panel and are no longer visible when switched off.

1.2. Models

G12

G12

The new BMW 7 Series has the development code G12 (long version). The market introduction will start in October 2015.

The following models will be available for the market introduction:

G12	Drive	Displacement in cm^3	Power in kW (HP)	Torque in Nm (lb-ft)
740i	6-cylinder gasoline engine	2998	240 (320) from 5500 rpm	450 (330) from 1380 rpm
750Li[2]	8-cylinder gasoline engine	4395	330 (445) from 5500 rpm	650 (480) from 1500 rpm

[2]Also available as xDrive

The mounting points for lifting the G12 are much further apart in the longitudinal direction of the vehicle than on the F02. For this reason, particular attention must be paid to ensuring that the vehicle hoist in question is suitable for lifting the G12.

- F02 distance of mounting points in longitudinal direction: 1690 mm / 66.5 inches.
- G12 distance of mounting points in longitudinal direction: 2073 mm / 81.6 inches.

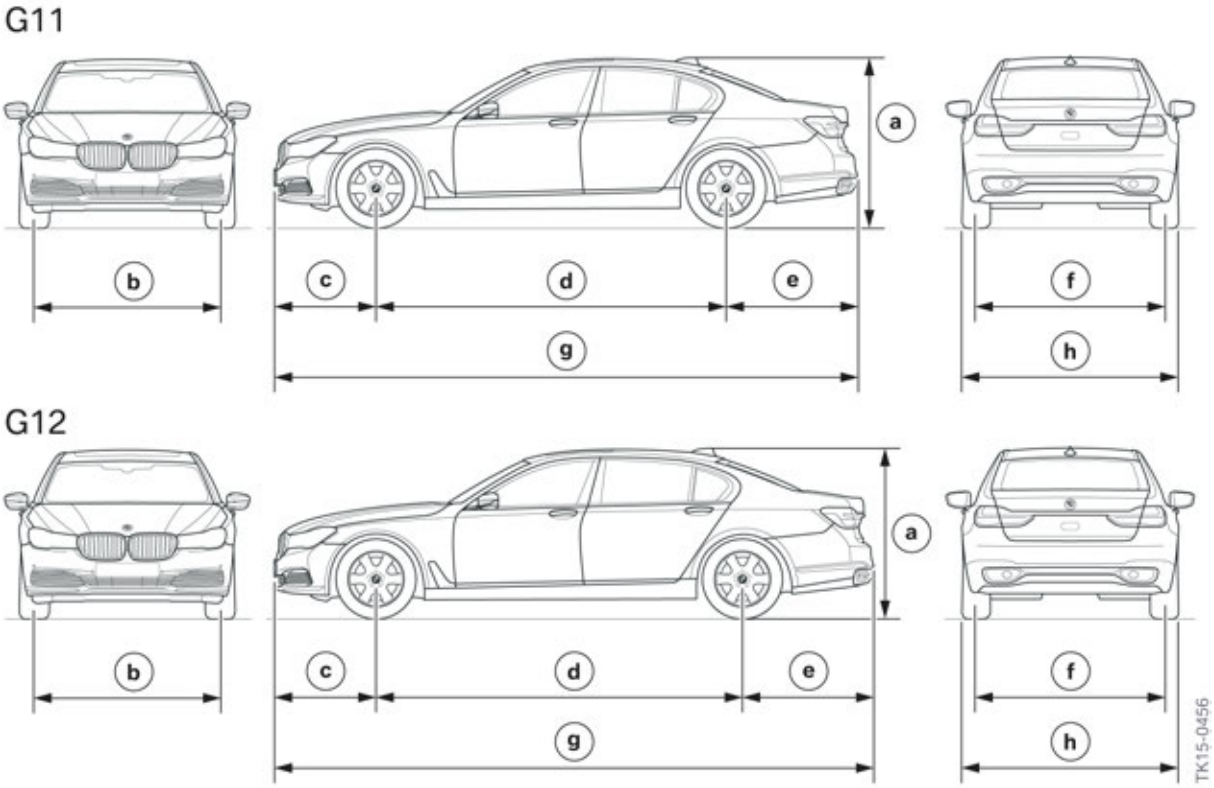
G12 Introduction

1. Introduction

1.3. Dimensions and weights

Below you can see the outer dimensions of the G12 in the BMW 740i:

The G11 is not available in the US market.



G11 Not For US/G12 outer dimensions

Index	Explanation		G12
a	Vehicle height, empty	[mm]	1479
b	Front track width, basic wheels	[mm]	1612
c	Front overhang	[mm]	890
d	Wheelbase	[mm]	3210
e	Rear overhang	[mm]	1148
f	Rear track width, basic wheels	[mm]	1650
g	Vehicle length	[mm]	5248
h	Vehicle width without exterior mirrors (vehicle width with exterior mirrors)	[mm]	1902 (2169)

G12 Introduction

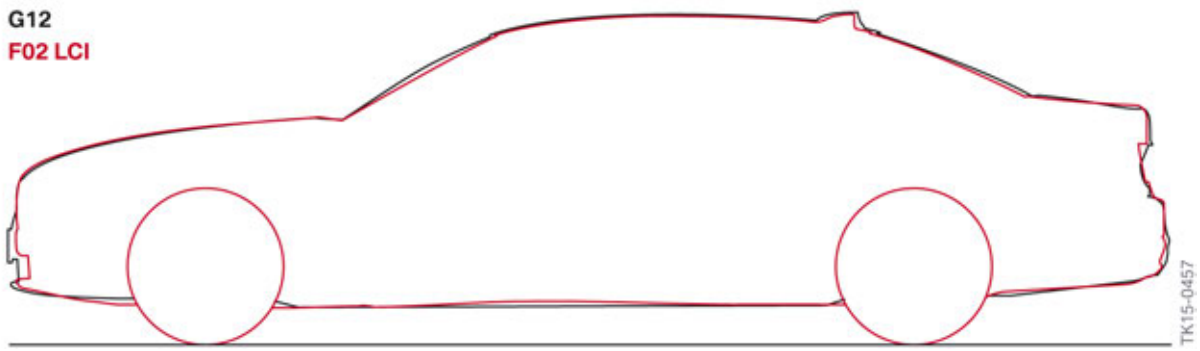
1. Introduction

Below you can see the US vehicle curb weights and the payloads of the G12 using the example of the BMW 740i and 750i xDrive:

Model		Curb weight Rear-wheel drive	Curb weight xDrive	Payload capacity Rear-wheel drive	Payload capacity xDrive
740i	[kg/lbs]	1916/4225	N/A	438/960	N/A
750i	[kg/lbs]	N/A	2091/4610	438/960	438/960

1.4. Silhouette comparison

The G12 to F02.



G12 dimensions

		G12	F02 LCI
Vehicle height, empty	[mm]	1479	1481
Front overhang	[mm]	880	866
Wheelbase	[mm]	3210	3210
Rear overhang	[mm]	1148	1143
Vehicle length	[mm]	5238	5219

G12 Introduction

1. Introduction

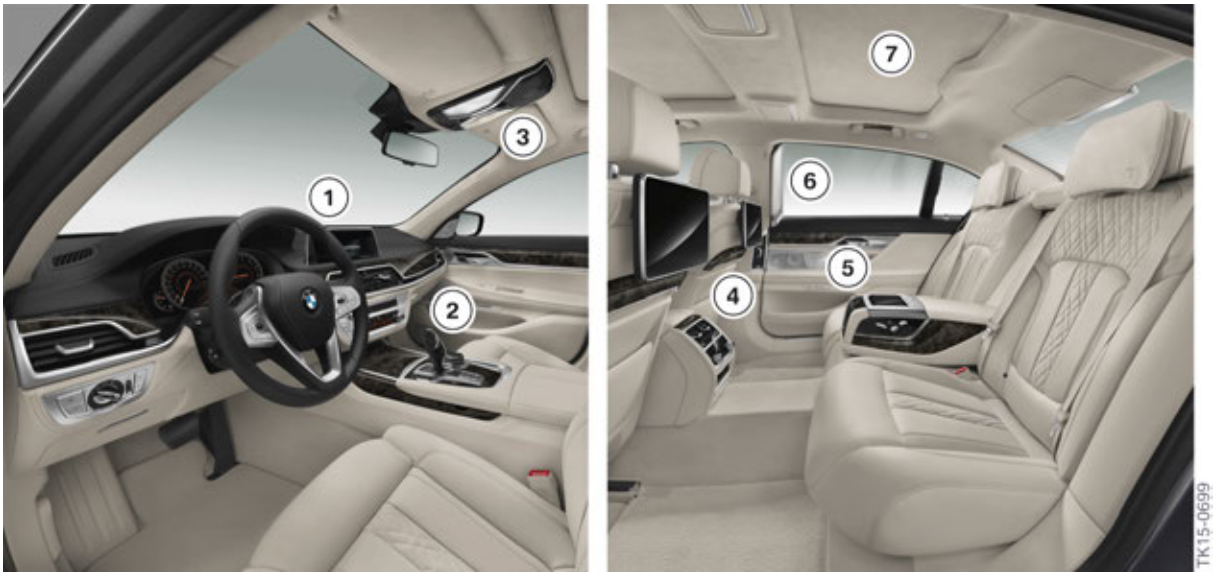
1.5. Design and equipment

G12 exterior highlights

Index	Explanation
1	Air vents on radiator grille
2	Chrome trim strip on Air Breather
3	Continuous trim strip on window cavity/door frame
4	Continuous rear trim strip
5	Integrated exhaust tailpipes
6	Light carpet

G12 Introduction

1. Introduction



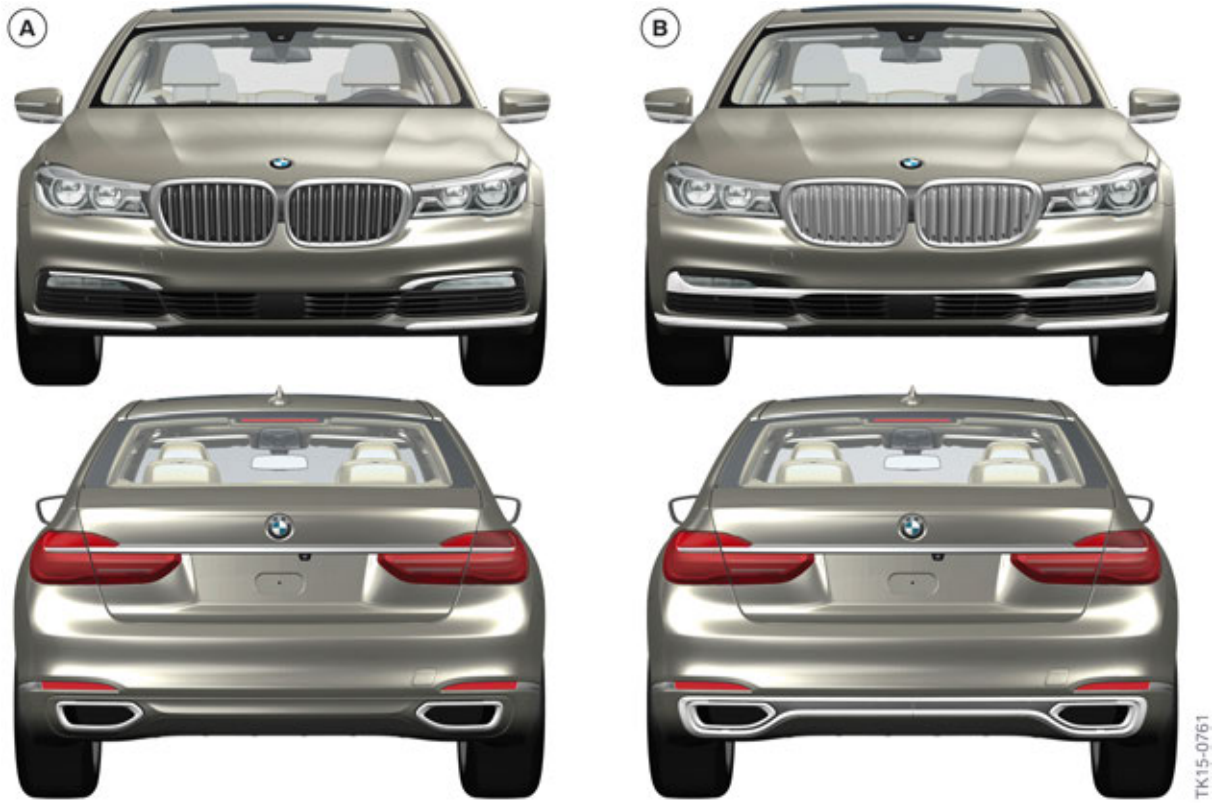
G12 Interior highlights

Index	Explanation
1	Central Information Display with touch operation
2	Interior fragrance
3	Camera for gesture control detection
4	Captain's chair
5	BMW Touch Command
6	Light saber
7	Panorama roof lighting “Sky Lounge”

G12 Introduction

1. Introduction

1.5.1. Exterior



G12 Exterior trim

Index	Explanation
A	Exterior trim on basic version
B	Exterior trim optional equipment

The basic version of the G12 already features a large number of chrome strips. The ornamental grille and the air flaps are finished in high-gloss Black and have chrome trims on the front surfaces. A chrome strip is fitted in each case above and below the bottom air inlets on the right and left.

Like on the F01/F02, the G12 also features tailpipes integrated in the body. These have a model-dependent design and are surrounded by a chrome frame. There is a further chrome strip in each case next to the reflectors in the rear bumper. The continuous chrome strip on the trunk is continued in the rear lights.

G12 Introduction
1. Introduction

1.5.2. Interior

The basic version of the interior equipment already has a high level of quality. The leather used in the interior is Dakota leather, which is available in different colors.

The following components are covered with leather in the basic version:

- Seat surfaces
- Upholstery insert on headrests
- Front and rear center armrests
- Armrests on the door trim panels

G12 Nappa exclusive leather

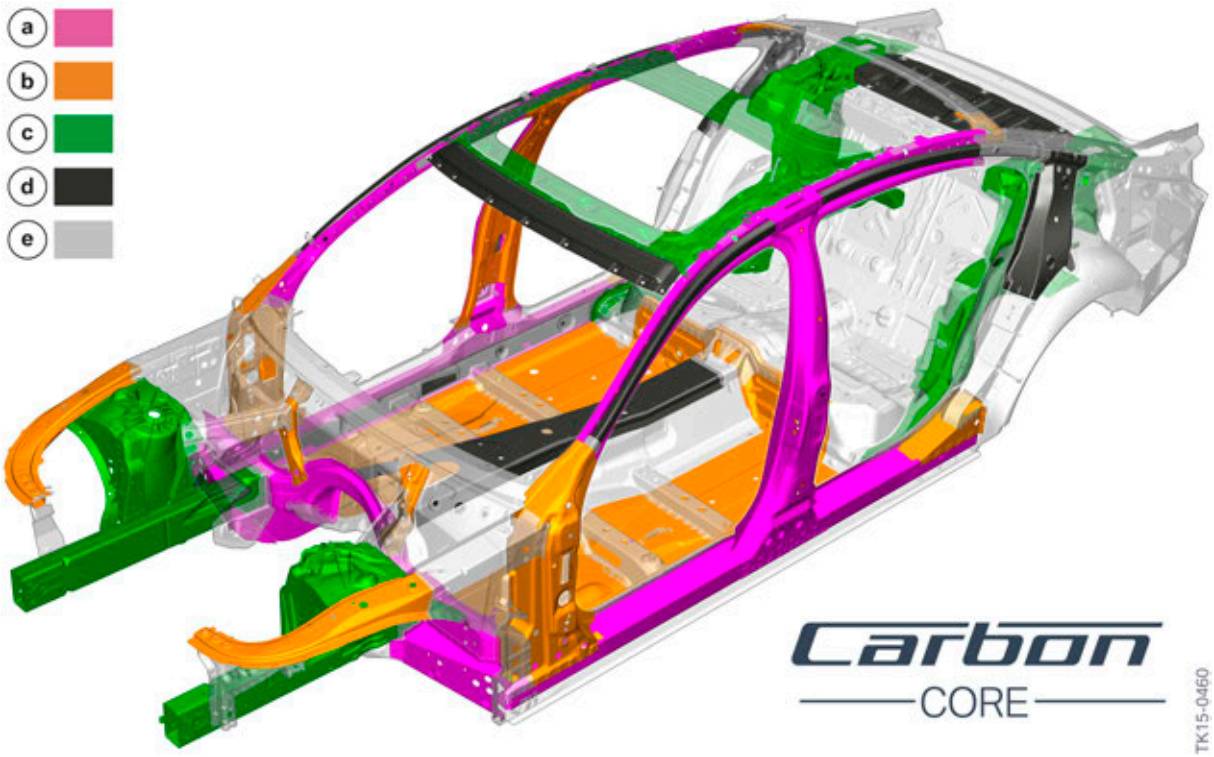
In the equipment specification Nappa leather with extended contents, additional seat and door trim panel components are covered with leather.

In this equipment specification, the leather features elaborate diamond stitching in the area of the center seat surfaces and backrests as well as on the backrest upper section. The leather of the seat surfaces and backrests is perforated in combination with the equipment “active seat ventilation”. The equipment “Exclusive leather Nappa with extended content” is available only in combination with comfort seats.

G12 Introduction

2. Bodyshell

2.1. Intelligent lightweight construction



G12 material concept for body structure

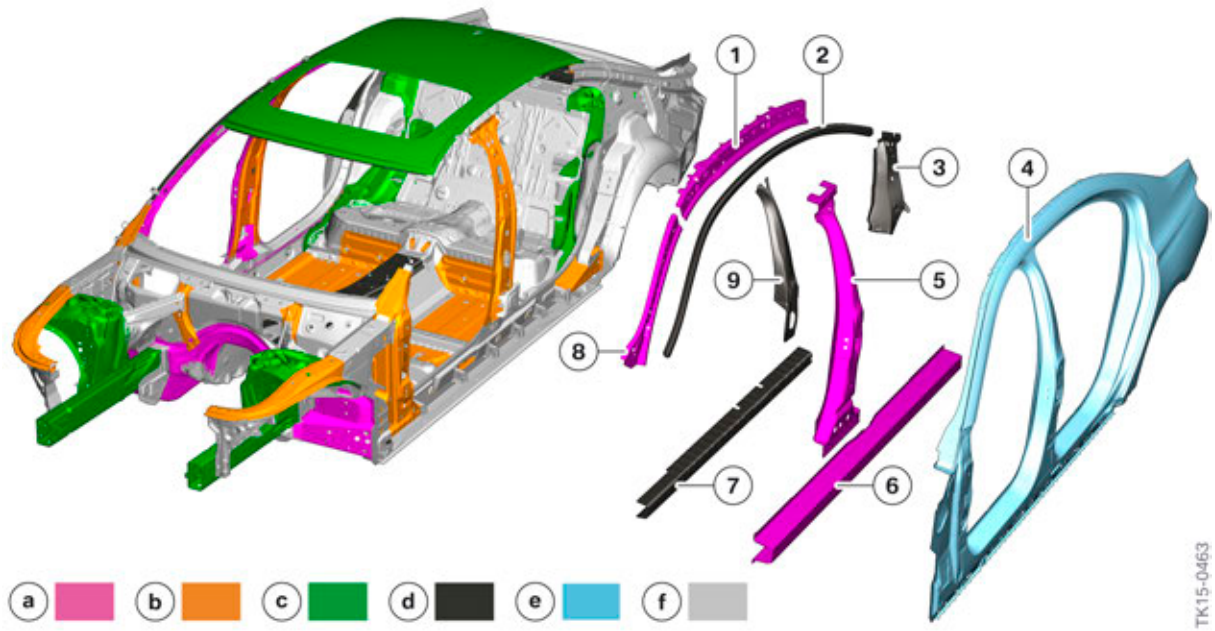
Index	Explanation
a	Ultra-high-strength hot-formed steels
b	Multiphase steels
c	Aluminium
d	Carbon
e	Other steels

The bodyshell of the G12 was designed completely as a lightweight construction. The focus here is on the body structure as a so-called carbon core. In addition to the components made of steel and aluminium, this also features numerous reinforcements made of carbon. The different materials are used so that their specific characteristics optimally complement each other. As a result, it is above all the material mix that ensures a low weight in combination with high crash safety.

Thanks to the intelligent material mix, it was possible to reduce the weight of the body structure by approximately 40 kg / 88 lbs compared with the F02.

G12 Introduction

2. Bodyshell



G12 Side frame structure

Index	Explanation
a	Ultra-high-strength steel (> 900 N/mm²)
b	Multiphase steel (> 300 N/mm²)
c	Aluminium
d	Carbon
e	Deep-drawing steel (< 300 N/mm²)
f	Other steel grades
1	Inner roof frame
2	Roof frame reinforcement
3	C-pillar reinforcement
4	Outer side frame (deep-drawing steel)
5	Reinforcement plate, B-pillar
6	Side sill reinforcement plate
7	Side sill reinforcement
8	Inner side frame
9	B-pillar reinforcement

The body structure of the G12 is made of steel, aluminium and carbon components. Through the consistent use of high-strength and ultra-high-strength steels and high-strength aluminium alloys, it was possible to increase the overall minimum proof stress of all metal materials in the bodyshell compared with the predecessor. An additional weight reduction was achieved by the use of carbon.

G12 Introduction

2. Bodyshell

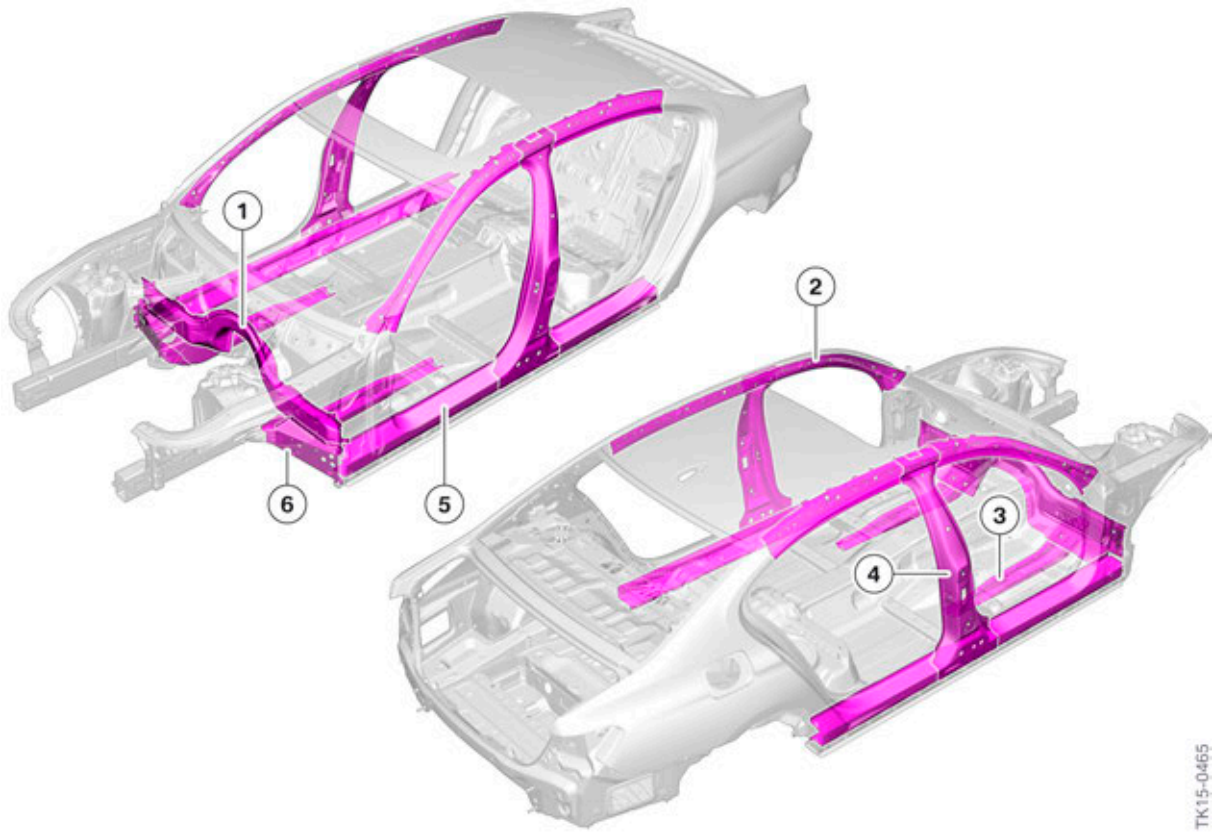
The side frame of the G12 comprises a three-piece frame:

- **Outer side frame**
  The outer side frame is made of deep-drawing steel.
- **Middle side frame**
  The middle side frame is made of a material mix comprising ultra-high-strength heat-formed steel and carbon. This combination means that the middle side frame is optimized both in terms of weight and rigidity.
- **Inner side frame**
  The inner side frame is made of high-strength and ultra-high-strength steel grades.

2.2. Body structure

The information in this chapter shows the body structure of the G12.

2.2.1. Steel



G12 Ultra-high-strength steels in the body structure

G12 Introduction
2. Bodyshell

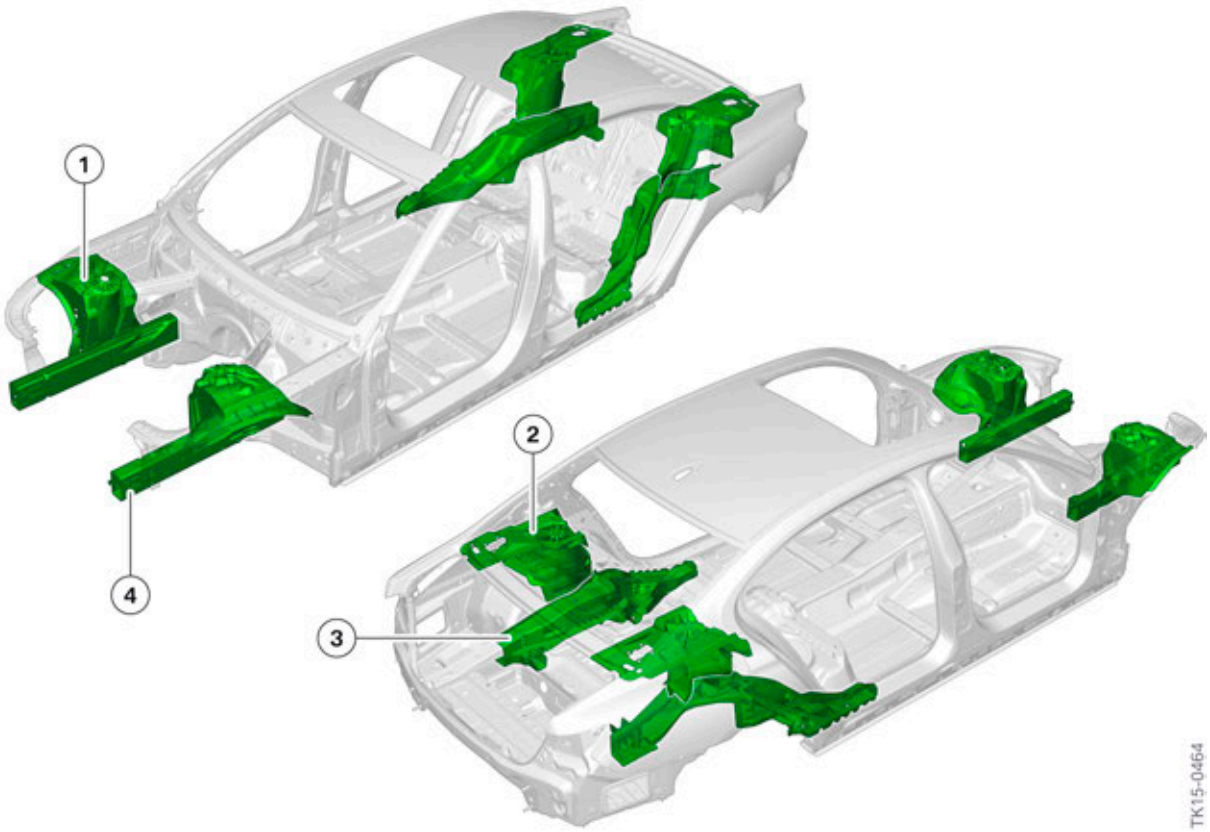
Index	Explanation
1	Carrier support, bulkhead
2	Inner side frame
3	Engine support extension
4	Reinforcement plate, B-pillar
5	Side sill reinforcement plate
6	Outer connecting plate

The body structure consists largely of high-strength and ultra-high-strength steel grades. The share of ultra-high-strength heat-formed steel grades is particularly high.

An example of this is the B-pillar reinforcement plate. This is made from a tailored rolled blank. This made it possible to achieve an additional reduction in weight.

Further information on the steel grades used for body construction can be found in the information bulletin **“Fundamentals of Steel”**.

2.2.2. Aluminium



G12 Aluminium in the body structure

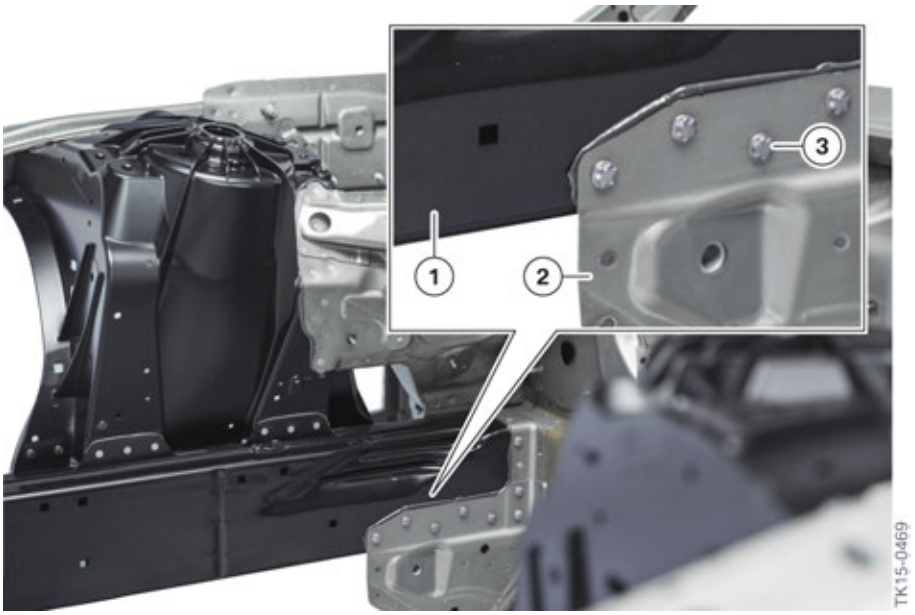
G12 Introduction
2. Bodyshell

Index	Explanation
1	Front spring strut dome
2	Rear spring strut dome
3	Side member
4	Engine support

The use of aluminium extruded profiles and complex die-cast aluminium parts permits realization of high body rigidity in combination with low weight. All requirements relating to passive safety are also met.

The spring strut domes at the front and, also for the first time, at the rear are manufactured using the aluminium pressure die casting process. New aluminium cast alloys were developed in order to increase the crash safety of these components. These alloys are characterized above all by improved crash performance.

Screw connections



G12 Screw connection of engine support/bulkhead

Index	Explanation
1	Engine support
2	Engine support connection
3	Flow drill screw (new mounting style)

Some of the aluminium-steel connections in the G12 body structure are produced using the new body joining technique of flow drill screws. These include, for example the connection between the engine support (aluminium extruded profile) and the bulkhead carrier support (ultra-high-strength hot-formed steel).

G12 Introduction

2. Bodyshell

Flow drill screws are driven directly into the superposed sheets. When this happens, the specially shaped tip produces a flow hole and a thread is then cut. This joining technique is used **exclusively** in production.

When a flow drill screw connection has been undone, it must not be joined again by means of flow drill screws. This could lead to a considerable reduction in strength.

In the event of a repair according to body repair level 2 and 3, the flow drill screws are replaced by blind rivets.

2.2.3. Carbon

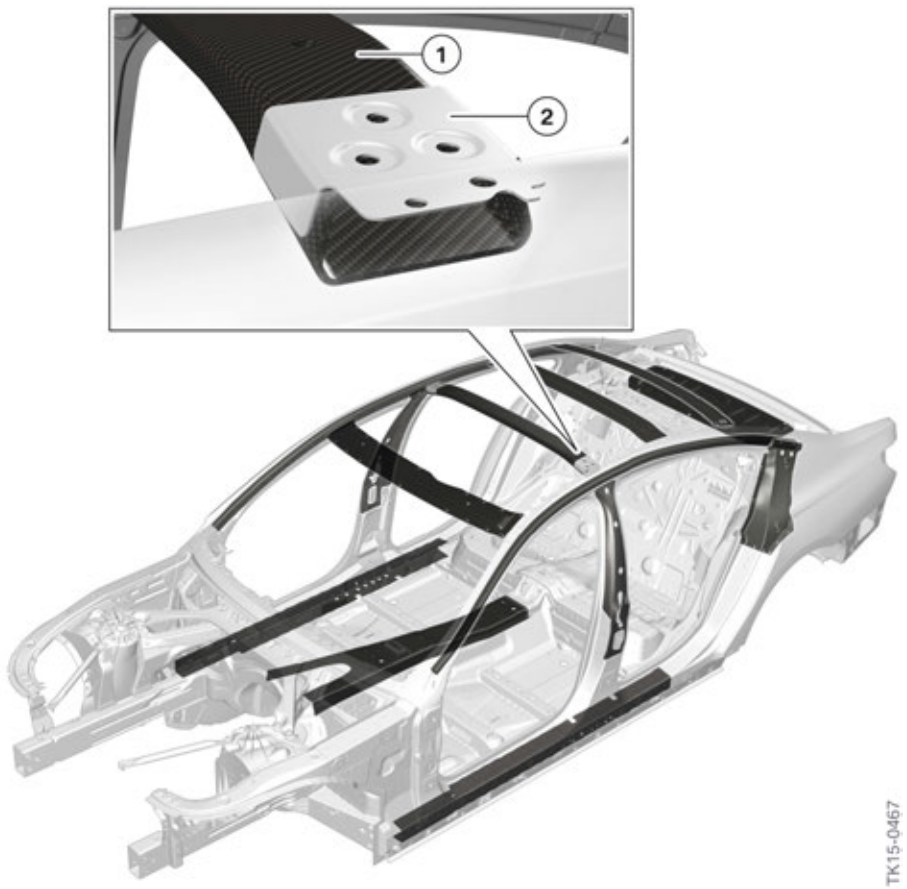
G12 Carbon in the body structure

G12 Introduction
2. Bodyshell

Index	Explanation
1	Roof bow (bonded, riveted)
2	B-pillar reinforcement (bonded)
3	Side frame reinforcement (bonded)
4	Transmission tunnel reinforcement (bonded)
5	C-pillar reinforcement (bonded, riveted)
6	Storage shelf (bonded and clipped)
7	Side sill reinforcement (bonded)

The body structure of the G12 is reinforced in many areas by carbon components. This makes the G12 the first large-series vehicle in the world in which carbon is used in the passenger safety cell.

Roof bow



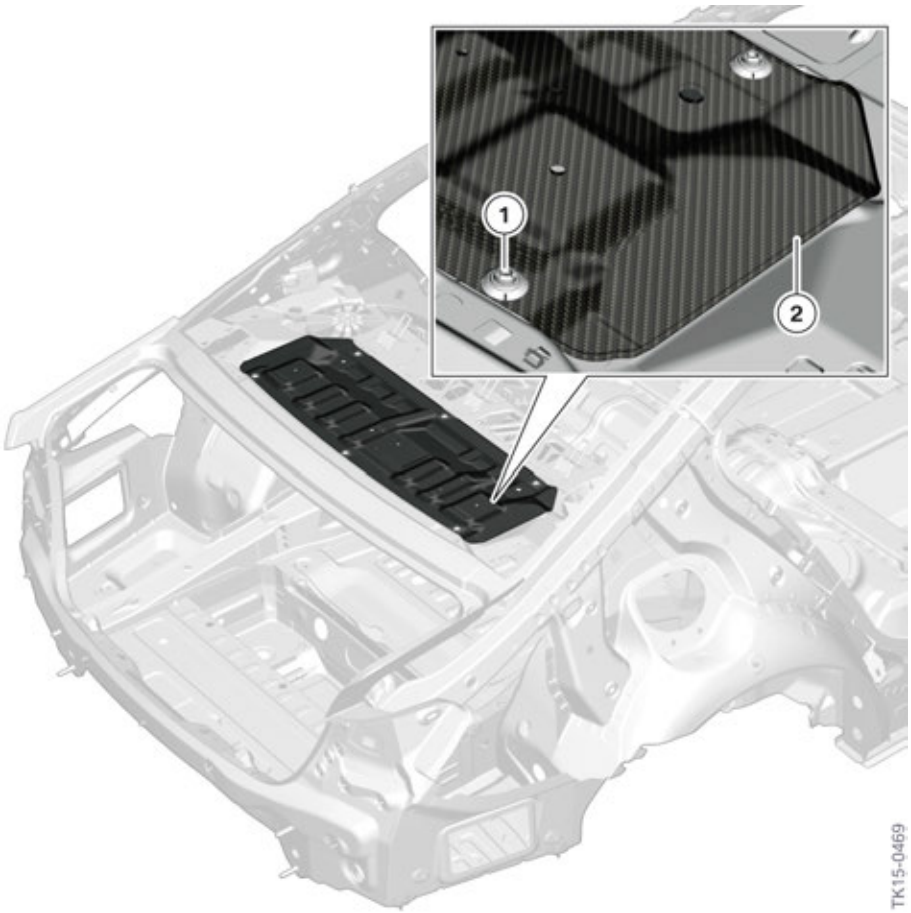
Roof bow

Index	Explanation
1	Roof bow made of carbon
2	Connection of side frame made of steel

G12 Introduction
2. Bodyshell

Some roof bows are made of a steel-carbon composite. This allows simple assembly in production

Rear window shelf



G12 Storage shelf

Index	Explanation
1	Plastic clip
2	Storage shelf made of carbon

The storage shelf of the G12 is made of carbon and is bonded and clipped together with the body structure. The clip connection is achieved by means of Lego-Fit (Ball socket). This is a type of press stud joining method which is used in production to fix the storage shelf in position. Lego-Fit (Ball socket) connections consist of a steel ball integrated in the body on the one side and a plastic clip on the opposite side.

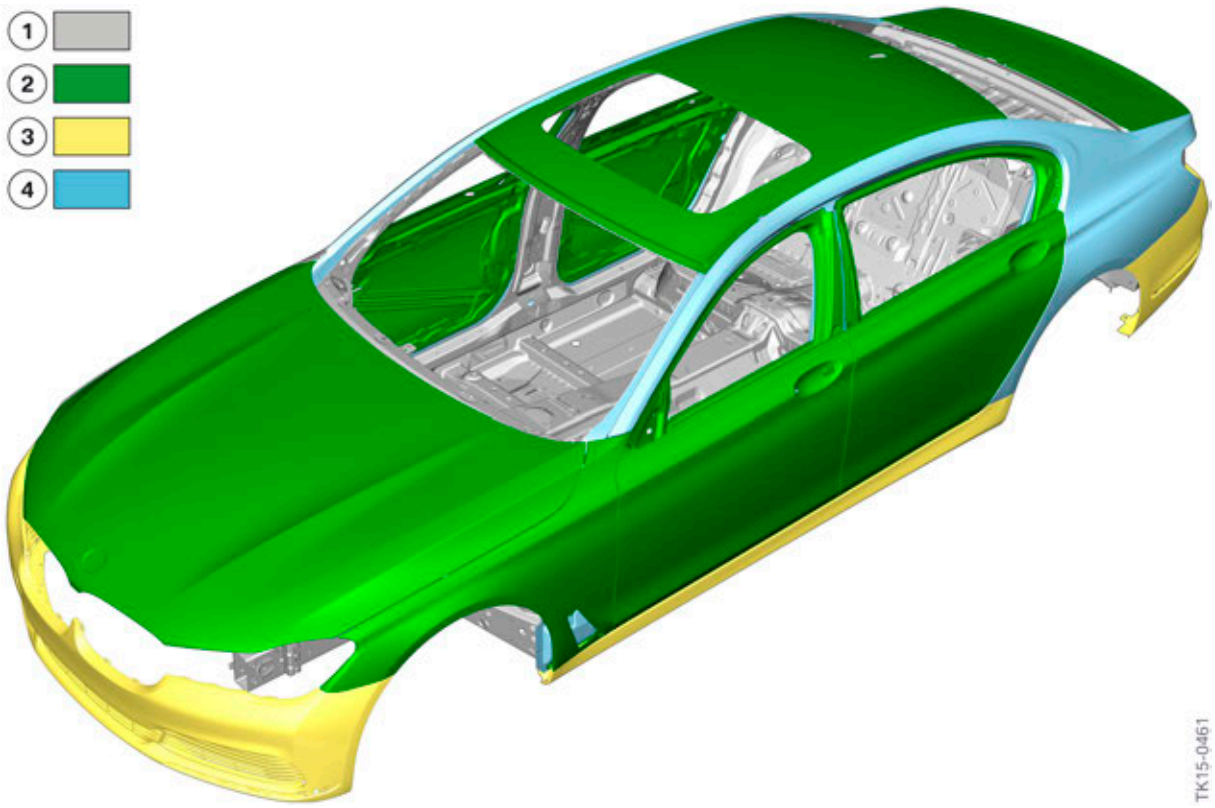
G12 Introduction

3. Body Repair Level 1

Taking into account the repair stages of the workshop information system of BMW, the body repair work in the technical training is divided into three repair levels. Each of the three Body Repair Levels includes certain prerequisites for the training of the employees and for the workshop equipment.

The special characteristics of the add-on body parts and the materials used in the outer body skin are described in this chapter. However, the basic functions of the roof and the outer body skin components made of plastic are the same as on other current BMW models. For this reason, these components will not be described in detail here.

3.1. Outer body skin materials



G12 outer body skin

Index	Explanation
1	Other steel grades
2	Aluminium
3	Plastic
4	Deep-drawing steel

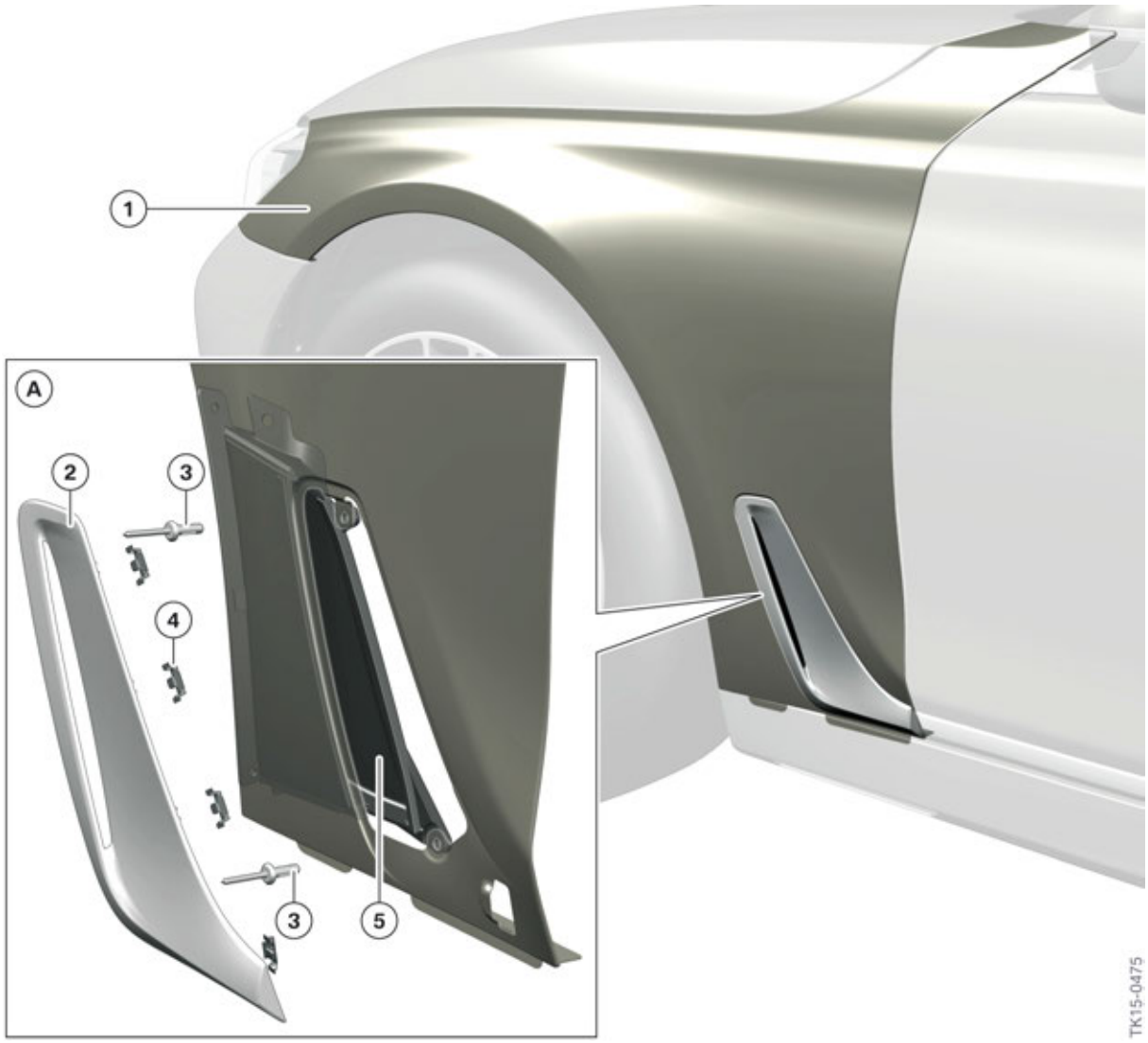
As on the predecessor F01/F02, the roof, doors, hood and front fenders are made of aluminium. The G12 trunk lid is also made of aluminium.

The bumper panels at front and rear as well as the side sills are made of plastic (PP + EPDM) as before. However, further development of this material made it possible to reduce the density and weight.

G12 Introduction

3. Body Repair Level 1

3.2. Front side panel



G12 Front side panel

Index	Explanation
A	Air Breather mounting
1	Front left side panel
2	Air Breather trim
3	Expanding rivet
4	Trim mounting clips
5	Air duct

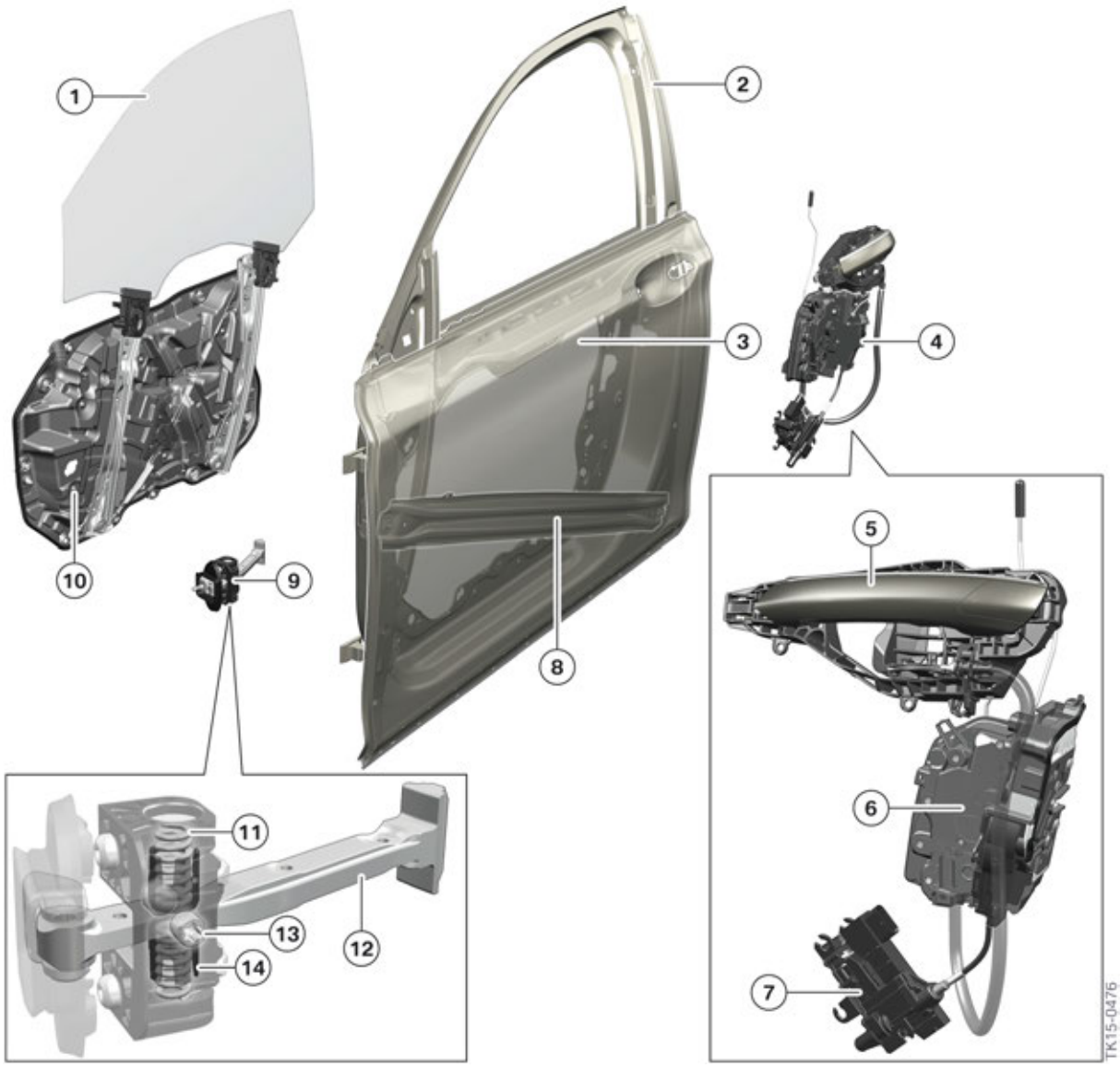
G12 Introduction

3. Body Repair Level 1

The Air Breather installed for the first time in the F34 is provided with chrome trim in the G12. This is fitted from the front in X-direction and locked in position at the rear in Y-direction by 4 metal clips. The air duct is attached to the front side panel by means of expanding rivets.

3.3. Doors

3.3.1. Front door



G12 Driver's door structure

G12 Introduction
3. Body Repair Level 1

Index	Explanation
1	Side window in driver's door
2	Door structure
3	Door outer skin
4	Door lock
5	Outer door handle mechanism
6	Rotary striker lock
7	Automatic Soft Close system
8	Side impact protection
9	Door stop
10	Lightweight support
11	Coil spring
12	Retaining strap
13	Set screw
14	Sliding element

The front and rear doors essentially have the same structure. The descriptions in this chapter refer to the driver's door.

Like on the predecessor, the doors of the G12 have an aluminium shell design. The aluminium supporting structure is connected with the aluminium outer skin by innovative laser welding technology.

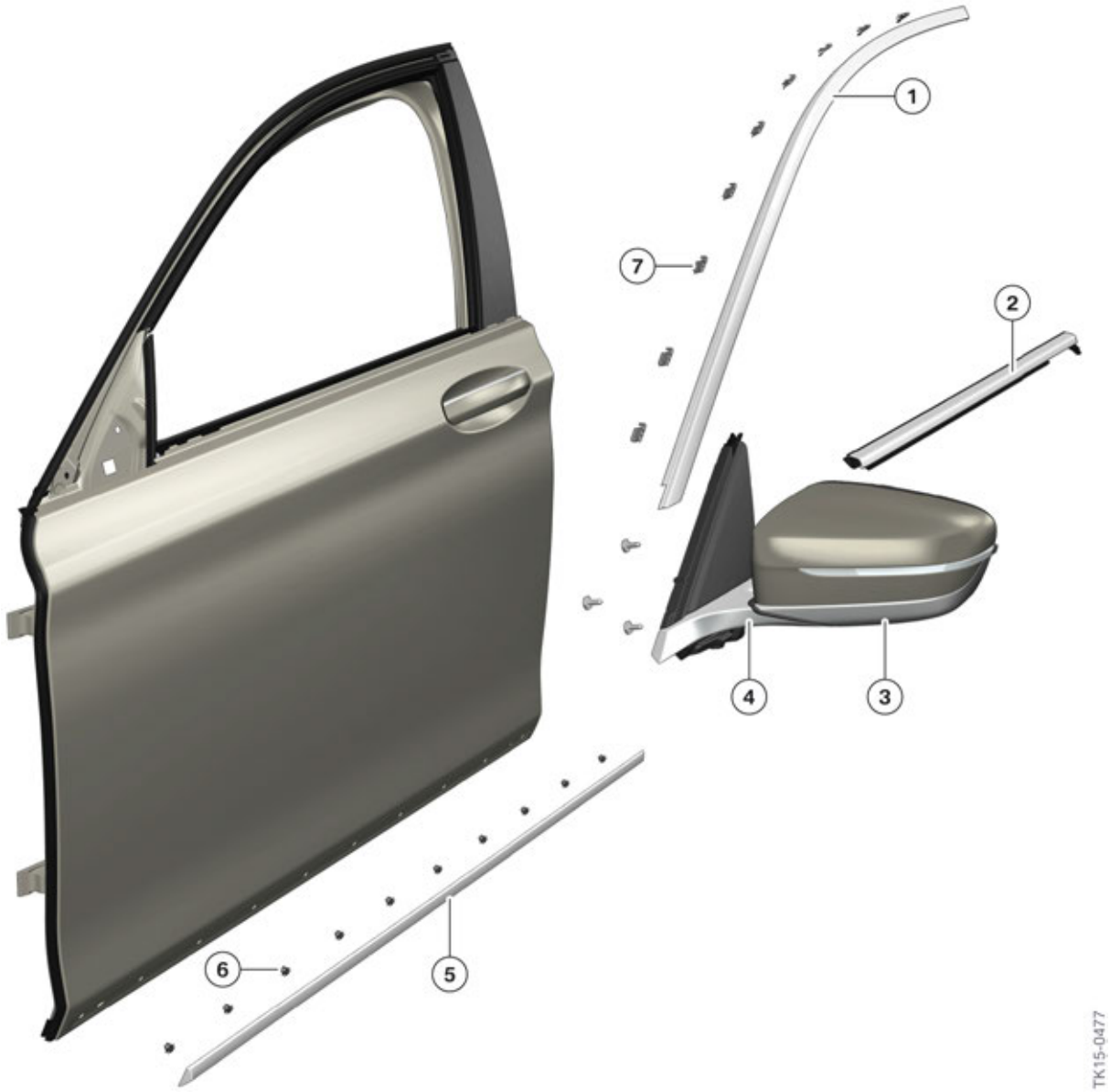
The stepless door stop holds the door in any position. The moment of friction required for this is produced by 2 set screws which are tensioned at the sides against the retaining strap. The set screws are adjusted in production and cannot then be adjusted again. In addition, 2 spring-loaded sliding elements hold the door in defined detent positions when the vehicle is inclined. These positions are determined by the geometry of the retaining strap. The compact design of the door stop makes it possible to achieve a weight saving for all door stops of approx. 2.5 kg / 5.5 lbs compared with the door stops on F01/F02.

The door lock optionally features automatic soft-close. Emergency operation is possible via the integrated lock cylinder.

The side impact protection is made of high-strength steel.

G12 Introduction

3. Body Repair Level 1



G12 Trim strips on front door

Index	Explanation
1	Trim strip on window frame
2	Cavity trim
3	Trip strip on mirror body
4	Trim strip on mirror base
5	Bottom trip strip
6	Mounting clips
7	Mounting clips

G12 Introduction
3. Body Repair Level 1

3.3.2. Rear door

G12 Rear door mountings

Index	Explanation
1	Trim strip mounting on window frame
2	Quarter glass mounting
3	Bottom trip strip
4	Mounting clips

A special feature of the rear doors is the one-piece design of the cavity strip and window frame trim strip. This is secured by means of 2 screws in the area of the Hofmeister kink. The other trim strip is locked in position as before. The quarter glass is screwed into place like on the F01/F02.

G12 Introduction

3. Body Repair Level 1

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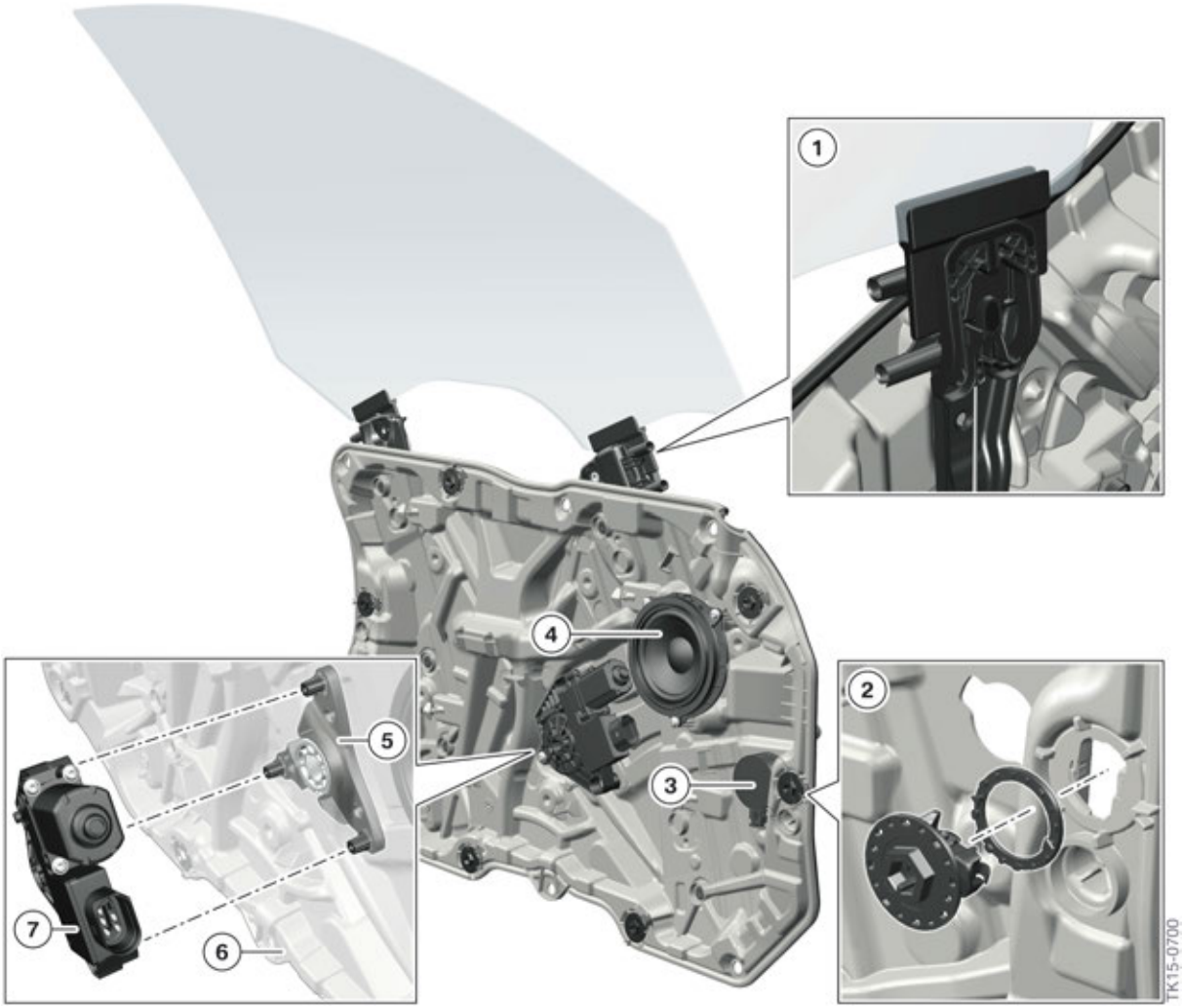
When tightening the screws, the tightening torque specified in the ISTA workshop information system must be observed exactly.

3.3.3. Lightweight support



G12 Lightweight support for driver's door

G12 Introduction
3. Body Repair Level 1

Index	Explanation
1	Side window latch mechanism
2	Bayonet fitting
3	Driver's door airbag pressure sensor
4	Driver's door speaker
5	Power window mechanism
6	Lightweight support
7	Power window motor

The lightweight supports of the front and rear doors have essentially the same design.
The descriptions in this chapter refer to the lightweight support for the driver's door.

The lightweight support is mounted on the door structure by means of screws and bayonet fittings. It divides the interior of the door into a dry side and a wet side. The dry side is closed off to the inside by the door trim panel and the wet side is closed towards the outside by the door outer skin. Sensitive components – such as speakers, airbag sensors and electric drives – are located on the dry side and are protected against moisture.

The power window mechanism is based on a cable mechanism. The electrical drive force is provided by an electric motor installed on the dry side of the lightweight support.

The door airbag sensors must not be cleaned with compressed air otherwise they will be destroyed.

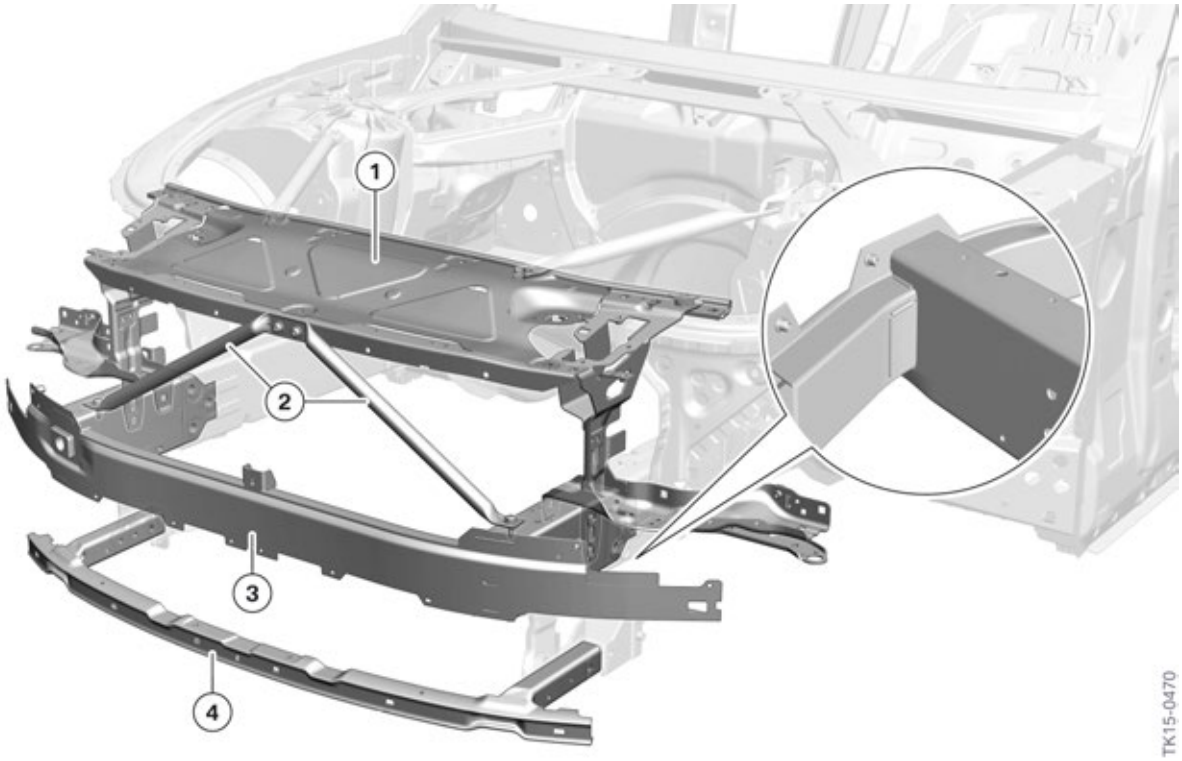
The seals of the lightweight supports must not be damaged in order to guarantee proper functioning of the airbag sensors in the doors.

G12 Introduction

3. Body Repair Level 1

3.4. Front end

3.4.1. Design



G12 Front end

Index	Explanation
1	Carrier
2	Reinforcement struts
3	Bumper support with deformation elements
4	Bottom bumper support

The front end makes a significant contribution to the rigidity of the front structure. At the same time, it serves as a support for components such as the headlights, auxiliary radiators and hood catches.

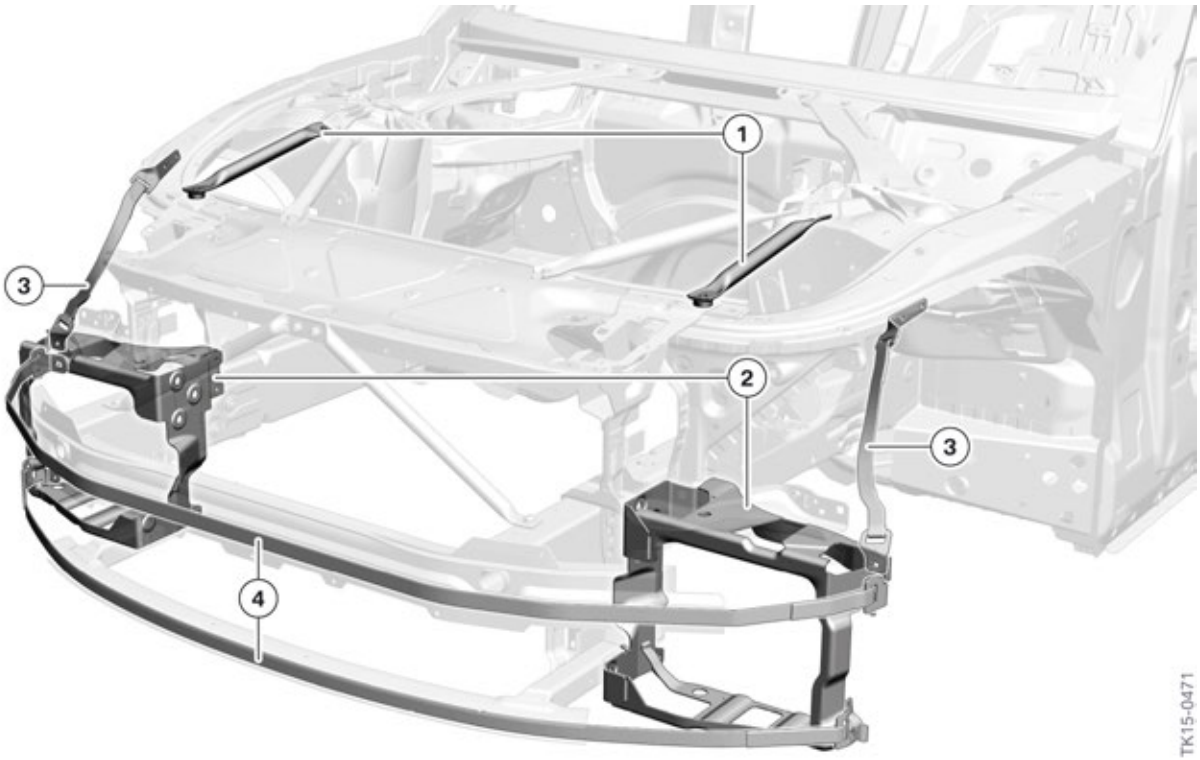
The front end also performs important tasks for crash safety:

- Complete absorption of the impact energy for accidents at slow speeds up to approx. 16 km/h / 10 mph.
- Avoidance of excessive loads on knee and hip joints in the event of an accident with pedestrians.
- Load distribution between the right and left vehicle halves in the event of a one-sided head-on collision.

G12 Introduction
3. Body Repair Level 1

In the G12, it has been possible to successfully meet the increased requirements for crash safety in spite of a weight reduction of the front end compared with the F01/F02. This was achieved mainly through the use of high-strength aluminium. A further reason is the one-piece design of the bumper support and deformation elements. The use of welded connections instead of screw connections saves weight and at the same time increases rigidity.

Additional US version components



Additional G12 Front end components

Index	Explanation
1	Additional struts
2	Crash frame
3	Tensioning strap for carrier support
4	Front tensioning straps

US version vehicles must pass an additional crash test, the small overlap test, for the purpose of optimum insurance classification.

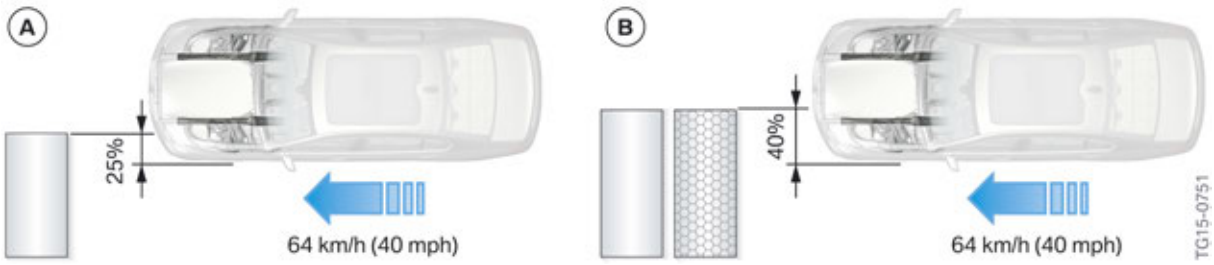
The small overlap in the "Small overlap test" means that there is, in principle, a risk that the front wheel will damage the bulkhead. This is avoided in the G12 in US version by additional components in the front end.

In the event of a corresponding head-on collision, the crash frame is pressed against the front wheel. As a result, the rim is guided so that the wheel is prevented from turning in. The tensioning straps stabilize the position of the respective crash frame.

G12 Introduction

3. Body Repair Level 1

3.4.2. "Small Overlap" crash test



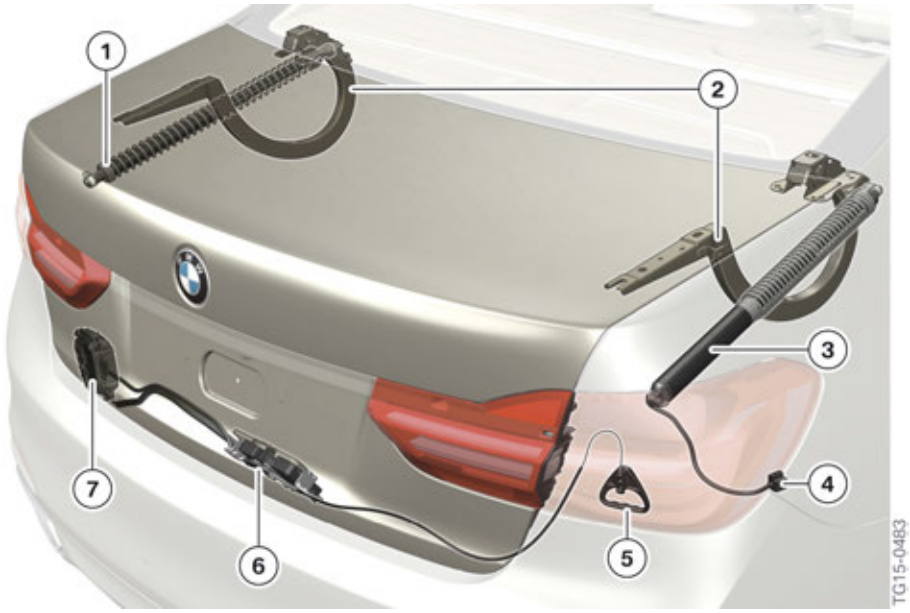
Crash test comparison US-IIHS

Index	Explanation
A	“Small Overlap” crash test with rigid barrier and an overlap of 25 % (IIHS*)
B	“Head-on collision crash test” with honeycomb barrier and an overlap of 40 % (EURO-NCAP) Not US

*IIHS: Insurance Institute for Highway Safety.

In the "Small Overlap" test, the vehicle is driven against a rigid barrier at a speed of 64 km/h / 40 mph. The overlap is only 25 % so that the impact energy cannot be transferred into the body structure directly via the engine support. Instead, the load path is via the front wheel to the side sill and via the bulkhead carrier support to the side frame.

3.5. Trunk



G12 Overview of Trunk

G12 Introduction
3. Body Repair Level 1

Index	Explanation
1	Tension spring (without damping element)
2	Trunk hinge
3	Electric spindle drive
4	Plug connector for spindle drive
5	Emergency release
6	Trunk lock
7	Electric motor for automatic soft-close system

The trunk of the G12 is made completely of aluminium for the first time. This made it possible to realize a weight saving of approx. 5.5 kg / 12 lbs compared with the trunk of the F02. The outer skin components area connected with each other by means of laser weld seams.

The G12 is equipped as standard with automatic trunk operation. The trunk is opened and closed by means of a spindle drive. Whereas other current BMW vehicles are equipped with one spindle drive each on the right and left sides, the G12 has a single spindle drive on the right side.

The following actuation options are available for the trunk, depending on the vehicle equipment:

	Opening	Close
Outer Trunk button	X	X
Inner Trunk button		X
Remote key/ID transmitter	X	
Button in driver's door	X	X
Contactless via sensors in the bumper	X	X
Emergency release via handle in the luggage compartment	X	

The trunk trim panel is made largely of kenaf. This is a natural fiber material that is already successfully used in the door trim panels of the BMW i3. Kenaf is characterized above all by its low weight and environmental friendliness. The visible surface of the trunk trim panel is made of black velour.

G12 Introduction

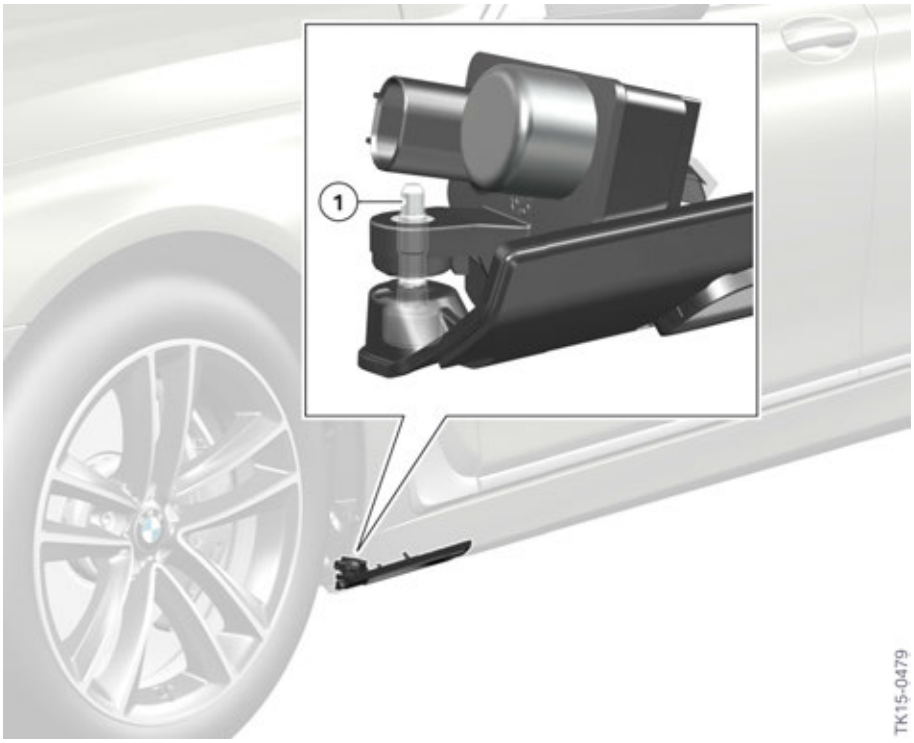
3. Body Repair Level 1

3.6. Light carpet

G11 Light carpet

The light carpet is a graphic projection in the entrance and exit area on the driver's and passenger's sides. It is standard for the G12. For more information about the light carpet, refer to the “General Vehicle Electronics” section of this reference manual.

G12 Introduction
3. Body Repair Level 1



G12 Light carpet adjustment

Index	Explanation
1	Adjusting screw

The light sources are located in the front area of the side sills. The light carpet is adjusted by means of an adjusting screw in each case. For this purpose, the light source can be continuously activated using the ISTA workshop information system.

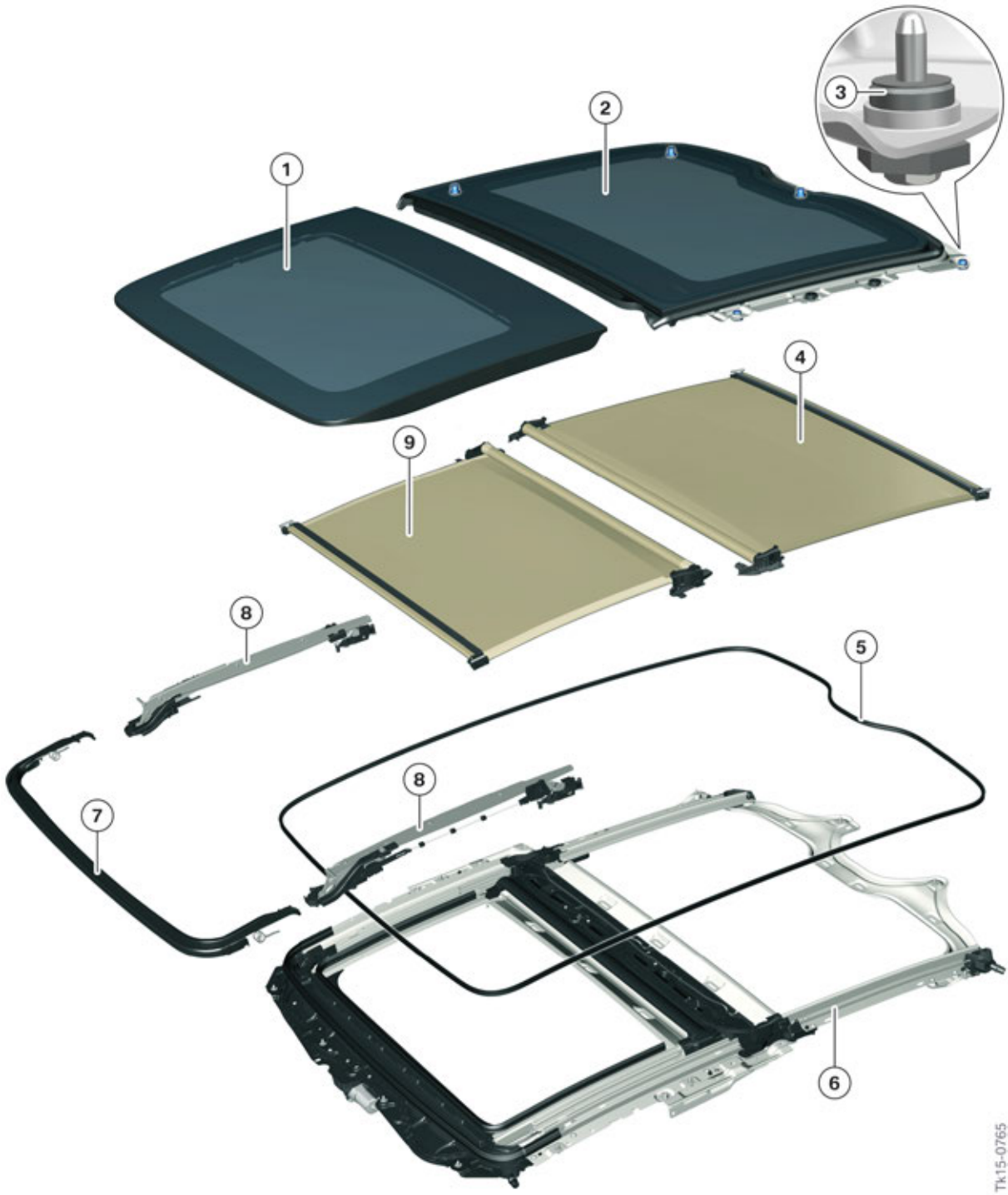
The light carpet is adjusted to a certain length between the start of the first projection line and the end of the last projection line. Attention must also always be paid to the symmetry between the left and right vehicle sides.

G12 Introduction

3. Body Repair Level 1

3.7. Panorama glass roof

3.7.1. Design



G12 panorama glass roof

Index	Explanation
1	Glass slide/tilt sunroof panel, front
2	Rear glass slide/tilt sunroof panel
3	Adjusting screw for rear glass slide/tilt sunroof panel
4	Rear panorama roof roller blind
5	Gasket
6	Panorama glass roof frame
7	Wind deflector
8	Tilt mechanism, front glass slide/tilt sunroof panel
9	Front panorama roof roller blind

The standard equipment for the G12 is the a panorama glass roof. Compared with the conventional glass slide/tilt sunroof, the panorama glass roof offers an improved feeling of spaciousness for the rear seat passengers.

The front glass slide/tilt sunroof panel can be moved externally over the rear glass panel. The rear glass slide/tilt sunroof panel is fixed and contributes to the rigidity of the body as a thrust surface.

The panorama glass roof is installed from inside. This makes it possible to omit trim elements in the edge area of the roof and a harmonious overall appearance is produced. The rear glass panel as an aperture to permit optimum positioning of the roof-mounted aerial.

3.7.2. Panorama roof roller blinds

As sun protection and noise insulation, the panorama glass roof has 2 panorama roof roller blinds, one each for the front and rear roofliner cutouts. These are available in different materials and colors.

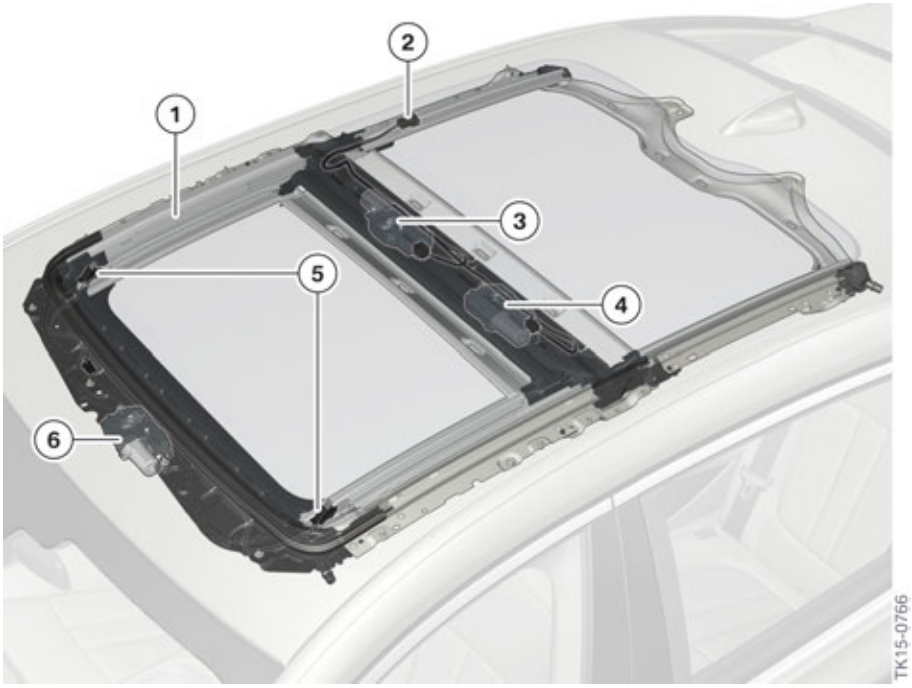
Operation is performed via the roof function center, the buttons in the rear doors or BMW Touch Command.

The panorama roof roller blinds can be opened and closed seamlessly and independently of each other. An anti-trap mechanism is active during automatic closing.

G12 Introduction

3. Body Repair Level 1

3.7.3. Drive



G12 Panorama glass roof frame

Index	Explanation
1	Panorama glass roof frame
2	Plug connector for panorama roof roller blinds
3	Drive unit for rear panorama roof roller blind
4	Drive unit for front panorama roof roller blind
5	Contacts for panorama roof lighting
6	Drive unit for front glass slide/tilt sunroof panel

The front glass slide/tilt sunroof panel and panorama roof roller blinds are driven by electric motors. The drive forces are transmitted to the cassette in the guide rails by means of cables.

The electric contacts of the panorama roof lighting which is option 407 (see interior equipment) of the front glass slide/tilt sunroof panel are located on the right and left in the front area of the panorama glass roof frame.

3.7.4. Functions

The panorama glass roof and panorama roof roller blinds have the following additional functions:

- **Rain closing**
  If the G12 is parked with open panorama glass roof and the rain-light-solar-condensation sensor detects rain, the front glass slide/tilt sunroof panel closes to the vent position.
- **Parking functions**
  If the G12 is parked with open panorama glass roof, the panorama glass roof will automatically move to vent position after 6 hours.
  When the vehicle is locked, the rear panorama roof roller blind is closed in order to prevent possible heating up of the rear seats and the BMW Touch Command due to solar radiation.
  When the vehicle is unlocked, the rear panorama roof roller blind is automatically moved to the position it was in before locking.
- **Convenient closing/convenient opening**
  The front glass slide/tilt sunroof panel and the panorama roof roller blind can be opened and closed via the ID transmitter.
- **Crash risk closing**
  In case of an accident, the front glass slide/tilt sunroof panel and the front panorama roof roller blind are automatically closed.

3.7.5. Notes for Service

Initialization

Initialization is frequently necessary after working on the panorama glass roof or panorama roof roller blinds. This can be recognized by the fact that automatic opening or closing of the panorama glass roof is not possible.

A function check must be performed after initialization.

No anti-trap function is available during initialization.

The procedure described in the ISTA workshop information system must always be observed.

Emergency operation

Emergency operation of the front glass slide/tilt sunroof panel is possible at the front drive unit using a hexagon socket wrench.

G12 Introduction

3. Body Repair Level 1

Installation and adjusting procedures

The components of the panorama glass roof can normally be replaced individually. It is necessary to pay attention to a number of special points to note for exchange as well as installation and disassembly.

- **Removal**
  Removal of the panorama glass roof in the workshop should be performed by at least 2 employees. Since the rear glass slide/tilt sunroof panel is secured and adjusted individually, it should also be transported individually. The panorama glass roof frame must not be lifted at the two front and rear ends. Otherwise, this may result in a kink in the middle part of the frame.
- **Assembly**
  The entire installation procedure for the panorama glass roof is performed from the vehicle interior. The rear glass slide/tilt sunroof panel is installed first and then the panorama glass frame together with front glass slide/tilt sunroof panel. The front glass slide/tilt sunroof panel must be moved to vent position before installation. A specific sequence must be observed when tightening the mounting bolts of the rear glass slide/tilt sunroof panel and the panorama glass roof frame. Leaks can occur if this sequence is not observed. Disassembly takes place in reverse order.
- **Setting**
  The rear glass slide/tilt sunroof panel is supplied pre-adjusted. Nevertheless, fine adjustment is necessary in some cases. This is performed in Z-direction by means of 5 adjusting screws. After installation of the panorama glass roof frame, the front glass slide/tilt sunroof panel is adjusted by means of its 6 mounting bolts. The trim covers inserted at the side must be removed for adjustment with installed roofliner.

The current procedures in the workshop information system must be observed for all work on the panorama glass roof.

G12 Introduction

3. Body Repair Level 1

3.8. Aerodynamics measures

3.8.1. Air flaps

G12 Air flaps

Index	Explanation
A	Top air flaps completely open
B	Top air flaps completely closed

A new generation of automatic air flap control is used in the G12. The air flaps are located at the top within the ornamental grille surround (radiator grilles) and behind the air inlets of the bumper panel.

The top air flaps are integrated in the front ornamental grille for the first time and are thus located in the direct field of view.

The top and bottom air flaps are controlled via separate actuators. When a corresponding cooling request is received, the bottom air flaps always open first and then the top air flaps. The bottom air flaps can also move to several intermediate positions. The air flaps are activated briefly when the ignition is switched on.

3.8.2. Underbody panelling

In comparison with the F01/F02, larger areas of the vehicle underbody area closed in the G12. This applies above all to the rear area. This results in reduced drag and also lower carbon dioxide emissions.

The use of textile material also improves the external acoustics.

G12 Introduction

4. Interior Equipment

The G12 sets new standards in its vehicle segment in the areas of luxury and innovation. There are significant enhancements in the vehicle interior compared to the F01/F02. The perception of the interior and all-round visibility have been improved. It was possible to significantly increase the amount of space in the rear passenger compartment.

4.1. Front overview

G11G12 Front overview

G12 Introduction
4. Interior Equipment

Index	Explanation
1	Camera for gesture control
2	Roof function center
3	Compartment for fragrance cartridges
4	12.3” Central Information Display with touch operation
5	Glove box, passenger's side
6	Locking switch, trunk
7	Center console
8	Wireless charging tray
9	Glove box, driver's side
10	tray with cup holders and cigarette lighter, front
11	Heating/air conditioning/radio control panel with touch operation (equipment-dependent)
12	12.3” instrument cluster with TFT display

The instrument panel already features a 12.3" Central Information Display (CID) as standard equipment. This display is a touch display. Some climate control functions can also be operated via touch-sensitive surfaces, depending on equipment.

The instrument cluster has an 12.3" display in the standard equipment. This allows the displays to be adapted to the respective driving situation. Some of the displays can be customized.

Some functions can be controlled contactlessly via the BMW gesture control. For example, the volume of the radio can be adjusted by a certain hand movement. In order to permit this function, a camera is installed in the roof function center.

There is a wireless charging tray in the center console for charging the optional BMW Display key (3DS). Certain smartphones (Samsung) can also be charged in the wireless charging tray. There must always only ever be one device for charging in the wireless charging tray.

In combination with the optional “Ambient Air package” (4NM), the vehicle interior can be scented with a fragrance at regular intervals. The compartment for the fragrance cartridges is located in the glove box.

The glove box contains a switch which can be used to separately lock the trunk. When the glove box is locked, the trunk can then no longer be opened without the mechanical ignition key. This is useful if the vehicle is parked by a parking service.

G12 Introduction
4. Interior Equipment

4.2. Ambient lighting

G12 Ambient lighting

The standard equipment “Ambiance lighting” (4UR) features extended scope and functionality for the G12 and includes lights in the following areas:

- Dashboard
- Door trim panels
- Front and rear door sill cover strips (strip and logo)
- Front footwell
- Front seat backrests
- Map pockets
- Rear footwell
- Door entry lights
- Light carpet in the entrance and exit area (see exterior trim)

The light design includes 6 different colors which can be selected via the menu in the Central Information Display or BMW Touch Command. The brightness of the ambient light can be adjusted independently of the interior lighting.

G12 Introduction
4. Interior Equipment

4.2.1. Panorama roof lighting

G12 Panorama roof lighting

In combination with the panorama glass roof , the optional equipment "Panoramic Sky Lounge LED Roof" (407) is available for the G12.

LED modules and optical fibers located at the sides illuminate the inside of the glass panels of the panorama glass roof. The light is refracted at the printed graphic and is diverted into the vehicle interior.

The lighting of the panorama glass roof can be dimmed independently of the other Ambient light elements and can also be switched on and off individually. The 6 different light colors are coupled to the Ambient light.

The lighting of the panorama glass roof is switched off automatically in the following situations:

- Panorama glass roof is opened/tilted
- Panorama roof roller blind is closed

Only the lighting in the corresponding area is switched off when the panorama roof roller blind is closed.

Further information on the LED modules and optical fibers is available in the Training Reference Manual **“G12 General Vehicle Electronics”**.

G12 Introduction
4. Interior Equipment

4.3. Door trim panels

Depending on equipment ZLU “Luxury Rear Seating Package”, the armrests in the front and rear door trim panels are heated.

4.3.1. Speaker lighting

On vehicles equipped with the optional (6F1) Bowers & Wilkins “High End Surround Sound System”, some speaker covers are illuminated blue. The brightness can be adjusted by means of the Central Information Display and BMW Touch Command. The speaker lighting is switched on when the vehicle is unlocked and switched off when the vehicle is locked.

4.3.2. Light saber

G12 Light saber

Index	Explanation
1	Light saber in the rear right door

Depending on equipment ZEC “Executive Package”, the G12 has additional interior lighting in the area of the B-pillars, the so-called light sabers. These are integrated in the window frames of the rear doors and have the task of creating a visual separation of the rear passenger compartment.

The lights can only be jointly switched on, off or dimmed. They light up exclusively in a warm white color. The brightness of the light sabers is reduced when the rear doors are opened in order to prevent other road users from being dazzled. When the rear doors are closed again, the light saber lights up again with the previously adjusted brightness.

Operation is possible via the following operating elements:

- Central Information Display
- BMW Touch Command
- Touch surface on right and left light sabers (capacitive sensors)

In the event of a fault, the affected light saber must be replaced as a complete unit. It is necessary to remove the door trim panel for this purpose.

4.4. Seats

4.4.1. Front seats

The following front seat versions are available for the G12:

- Power front seat, electrically adjustable, with memory.
- Multi-contour seat, electrically adjustable, with memory.

	Power front seat adjustment with memory (OE 459)	**Multi-contour seats front, electrically adjustable (option 456)**
Seat memory	Standard equipment	Standard equipment
Seat heating for driver/front passenger	OE 4HA	OE 4HA
Lumbar support	Standard equipment	Standard equipment
Active seat ventilation, front	Optional equipment 453	Optional equipment 453

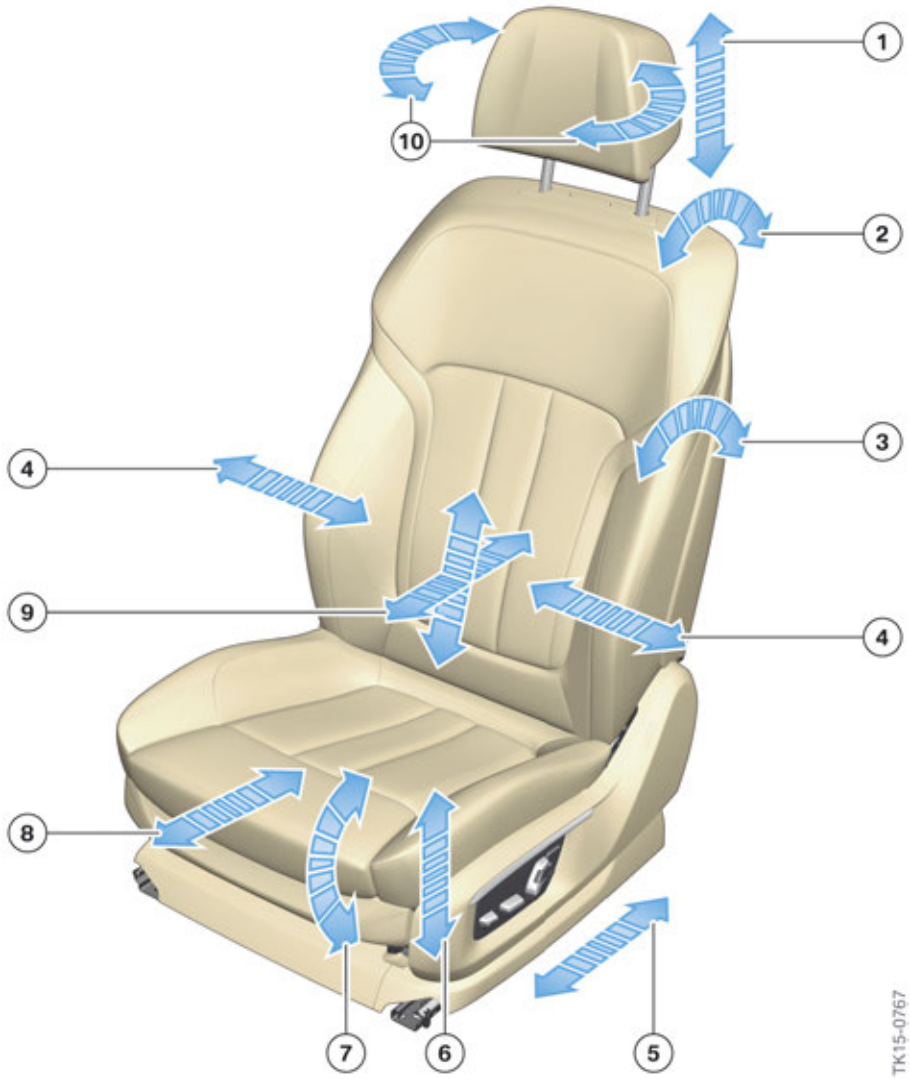
The front active seat ventilation is performed via individual fans located in the seat surfaces and backrests.

The output of the seat heating in the backrests and seat cushions can be adjusted separately via the menu.

G12 Introduction

4. Interior Equipment

Seat adjustment



G12 Seat adjustment, front Multi-contour seat

Index	Explanation
1	Head restraint height adjustment
2	Backrest upper section adjustment
3	Backrest angle adjustment
4	Backrest width adjustment
5	Forward/back seat adjustment
6	Seat height adjustment

G12 Introduction
4. Interior Equipment

Index	Explanation
7	Seat angle adjustment
8	Seat depth adjustment
9	Lumbar support
10	Head restraint side bolster adjustment (mechanical)

G12 Seat adjustment, front seat

Index	Explanation
A	Display on Central Information Display (backrest angle adjustment forwards)
B	Seat adjustment switch, driver's seat

The seat adjustment switch has 5 touch-sensitive sensors. The adjustment is already shown on the Central Information Display (CID) before actuation takes place on the corresponding switch.
The movement of the corresponding seat component is then displayed on the CID during seat adjustment. The display disappears again after seat adjustment has been completed.

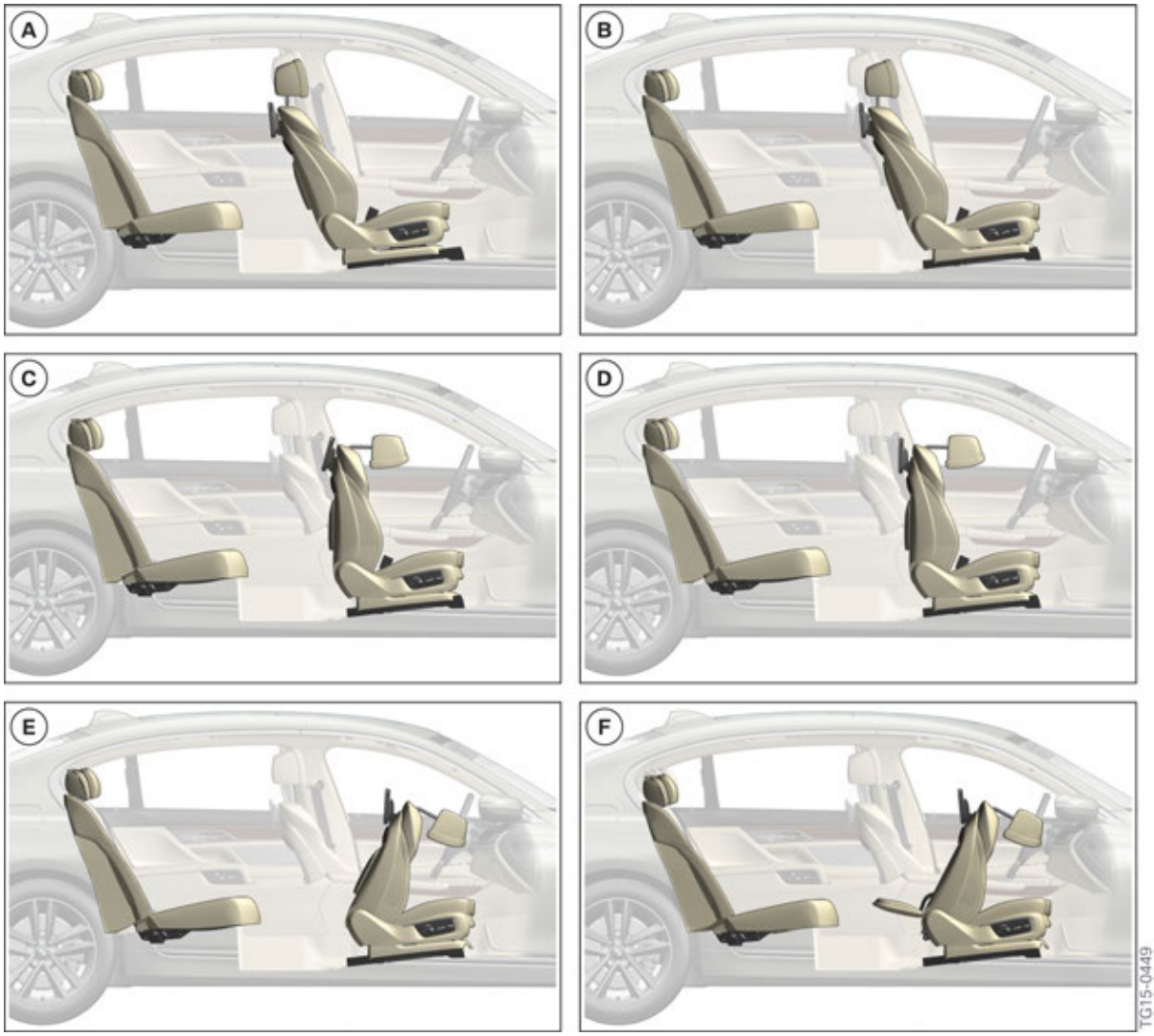
Further information is provided in the Training Reference Manual **“G12 Displays and Controls”** and **“G12 General Vehicle Electronics”**

Captain's chair

In the equipment specifications “Rear Executive Lounge Seating Package” (ZRE), the front passenger seat on the G12 has extended functionality. As a result, the occupants in the rear seat on the passenger's side benefit from maximum visibility and legroom. This version of the front passenger seat is called “captain's chair”.

G12 Introduction

4. Interior Equipment



G12 Captain's chair adjustment

Index	Explanation	Customer benefit
A	• Front passenger seat is in initial position	
B	• Front passenger seat moves forward to end position • Front passenger seat moves down to end position	Increased legroom
C	• Seat backrest angle adjustment to vertical position • Head restraint folds fully forwards	Increased visibility

G12 Introduction
4. Interior Equipment

Index	Explanation	Customer benefit
D	• Rear compartment display on front passenger seat is adjusted	Optimum view of display screen
E	• Backrest angle adjustment moves to front end position • Front passenger seat moves forward to extended end position (+ approx. 90 mm)	Maximum legroom
F	• Footrest on front passenger seat folds out	Reclining seat position

The front passenger seat has an extended adjustment range in forward direction for the forward/back seat adjustment, a maximized backrest angle, a folding head restraint as well as an integrated, fold-down footrest.

During adjustment of the front passenger seat, the right rear seat is adjusted to a comfortable reclining position.

The following front passenger seat functions are **not** available in the "captain's chair" version:

- Backrest width adjustment
- Backrest upper section adjustment
- Lumbar support
- Height adjustment of head restraint
- Massage function

G12 Captain's chair button

The "captain's chair" is operated by means of a button in the rear door on the passenger's side.
The preset end position can be manually adjusted and saved by means of the memory function.

It is not possible to travel to the extended position if the front passenger seat is occupied. Occupancy of the seat is detected by means of the seat occupancy mat and the seat belt buckle.

⚠

Depending on equipment, the front seats have a side airbag and crash-active headrests. Information on this can be found in the Training Reference Manual **“G12 Passive Safety Systems”**.

G12 Introduction

4. Interior Equipment

4.4.2. Rear seats

The G12 is equipped with a rear seat bench with 3 seats and a fold-down center armrest. In the equipment specification “Comfort seats in the rear passenger compartment, electrically adjustable” option code (460), the rear seat passengers have the following adjustment options on the two outer seats:

G12 Seat adjustment, rear comfort seat

Index	Explanation
1	Head restraint height adjustment
2	Backrest upper section adjustment
3	Backrest angle adjustment
4	Forward/back seat adjustment
5	Lumbar support
6	Seat angle adjustment
7	Head restraint side bolster adjustment (mechanical)

A further equipment feature is the removable Alcantara pillow on the comfort head restraints.

The rear seats are adjusted via the operating elements in the center armrest or BMW Touch Command.

Rear Executive Lounge Seating Package (ZRE)

The following equipment is available for the G12:

Equipment	Executive Lounge Seating (OE 7GZ)
Number of seats in rear passenger compartment	2
Comfort seats in the rear	X
Captain's chair	X
Rear console	X
BMW Touch Command	X
Table in the rear console	X
Massage function in rear passenger compartment	X
Active seat ventilation in rear passenger compartment	X
Active seat ventilation, front	X
Rear-seat entertainment Experience	X

X Included in this equipment package.

4.4.3. Massage functions

Extensive massage functions are available in the G12 for the front seats option code (4T7) and rear seats option code (4T6). 8 different massage programs can be used to activate or relax muscles or relieve the strain on the back. It is possible to choose between 3 different intensity levels.

The 8 massage programs can be divided into 3 categories:

- **Activation**
  In the case of the activation programs, it is possible to choose between the body areas of pelvis, upper body or full body. During the massage, the strain on the spine is relieved by targeted body movements.
- **Relaxation**
  The relaxation programs offer a choice between the body areas of back, shoulders or lumbar region. The muscles are relaxed by the massage.
- **Vitalization**
  The vitalization programs comprise mobilisation and relaxation elements. The occupant can choose between the body areas of upper body and full body. The combination of movement and massage ensures optimum relaxation and recuperation particularly on long journeys.

The massage programs can be selected and adjusted by means of the following operating elements:

- Central Information Display (front)
- BMW Touch Command (rear)
- Rear seat entertainment system (rear)

G12 Introduction
4. Interior Equipment

Without the equipment “BMW Touch Command” (6U9) or “Rear seat entertainment Experience” (6FR), only the standard massage program can be operated from the rear passenger compartment. This is done by means of a button in the door.

Body training in rear passenger compartment

G12 Massage display on rear compartment display

Index	Explanation
1	Please press both shoulders against the seat with equal force.

Active interaction between the rear seat passengers and rear seat is offered for the first time at BMW for the rear seats of the G12 . This function allows the occupants to relax on long journeys and to regenerate their back by active movements. For this purpose, the customer is given instructions to perform specific physical movements. These are evaluated and then displayed to the customer. Following the body training, the customer is provided with an overview of his training success. The customer's body movements are detected by the pressure increase in the respective massage cushion. Additional sensors are not required for this function.

The rear passenger compartment body training is part of the massage function for the rear passenger compartment (4T6). However, it is available only in combination with the optional equipment "Rear seat entertainment Experience” (6FR) since the instructions are displayed on the rear compartment displays.

G12 Introduction
4. Interior Equipment

Design

G12 Massage seat, front, driver's side

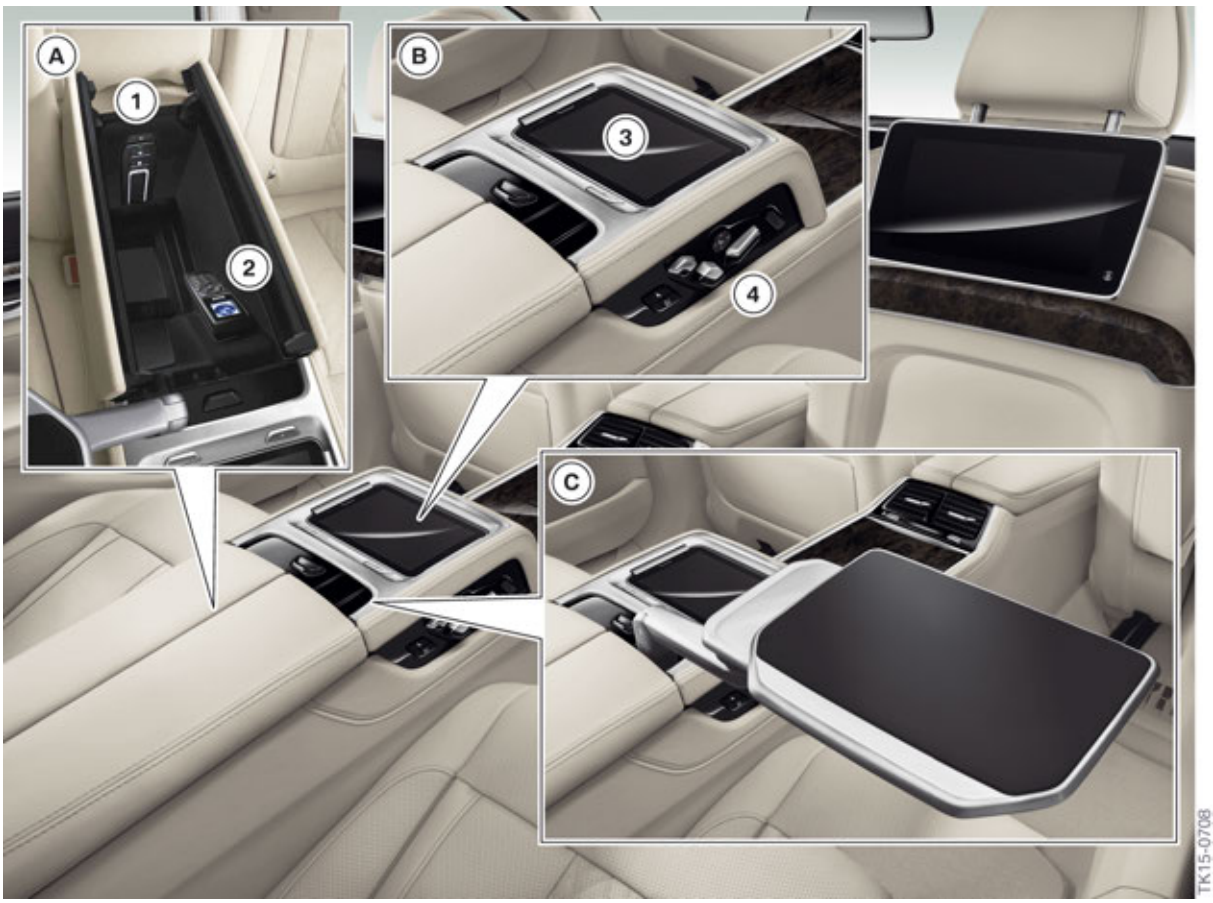
Index	Explanation
1	Air cushion on inner backrest (massage)
2	Air cushion for shoulders (massage)
3	Air cushion for lumbar region (massage)
4	Air cushion for lumbar support
5	Air cushion for seat surface (massage)
6	Seat pneumatics module pump
7	Seat pneumatics module (control unit and valve block)

The massage functions are controlled by the respective seat pneumatics modules.

G12 Introduction
4. Interior Equipment

When working on the pneumatic components, it must be ensured that the lines are routed exactly, otherwise there is a risk of the lines being kinked.

4.5. Rear console



G12 Rear console

Index	Explanation
A	Storage compartment
B	Operating elements for rear console
C	Tray table on rear console
1	Market specific function
2	Market specific function
3	BMW Touch Command
4	Operating element for rear right seat adjustment

G12 Introduction
4. Interior Equipment

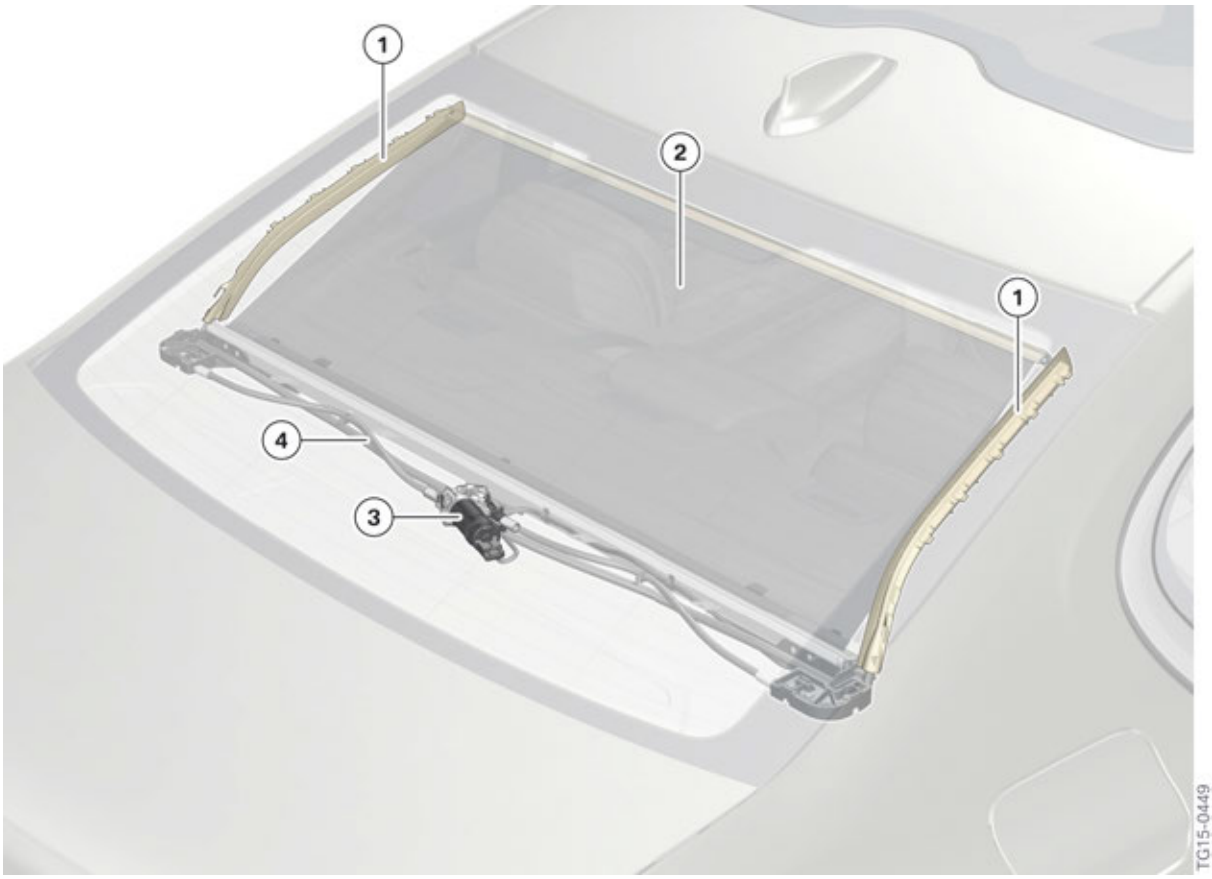
In the standard equipment, the G12 has a fold-down armrest in the rear seat. A stationary rear console is optionally available for the G12.

Depending on equipment, the armrest of the rear console is heated. The snap-in adapter for insertion of the SIM card as well as the handset are optionally contained in the rear console. A fold-down tray table is also installed.

The operating panels for seat adjustment are located at the side of the rear console.

4.6. Roller sunblinds

4.6.1. Roller sunblind for rear window



G11G12 Roller sunblind for rear window

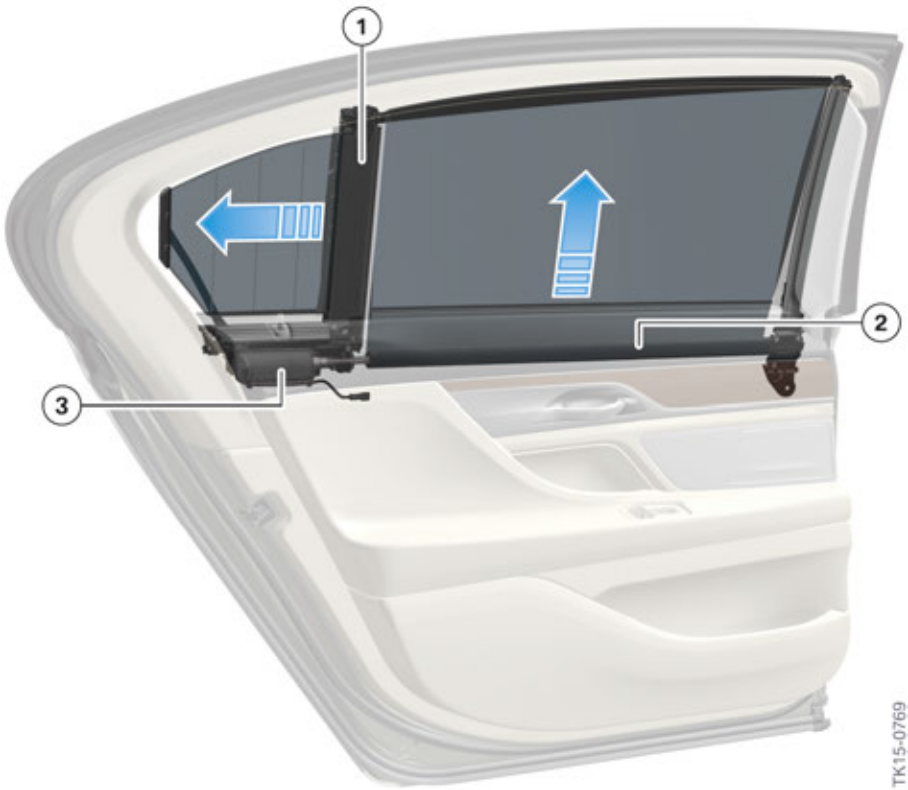
Index	Explanation
1	Guide rails, C-pillar
2	Roller sunblind
3	Electric motor
4	Feed lines

G12 Introduction
4. Interior Equipment

The rear window roller sunblind (415) standard on the 750i is guided by means of side guide rails in the C-pillar trim panels. The sunblind provides maximum protection against the sun in the rear window and also improves acoustics.

The rear window roller sunblind is driven by an electric motor. The drive forces are transmitted to the cassette in the guide rails by means of cables. Operation is possible via buttons in the front and rear door trim panels and by the BMW Touch Command.

4.6.2. Roller sunblind for side window



G12 Roller sunblind for side window

Index	Explanation
1	Side window roller sunblind
2	Roller sunblind for side window
3	Electric motor

The roller sunblinds for the rear side windows/side window glass (416) are offered in combination with the optional equipment rear window roller sunblind (415).

There are 2 individual roller sunblinds in each case in the rear doors for the moving side window and fixed side window glass. The roller sunblinds are driven by a common electric motor. This means that the two roller sunblinds can only be opened or closed at the same time.

The blinds are operated via buttons in the door trim panels or by the BMW Touch Command.

G12 Introduction

5. Luggage Compartment

G12 Overview of luggage compartment

Index	Explanation
1	G12 Luggage compartment with through-loading system (OE 465)
2	G12 Luggage compartment with BMW Individual coolbox (OE 791) Not for US
3	G12 Luggage compartment with compact spare wheel (OE 300)
4	G12 Luggage compartment with extended rear air conditioning (OE 4NF) Not for US

The luggage compartment dimensions of the G12 have increased slightly in comparison with the F01/F02. As a result, the luggage compartment capacity has grown from 500 l to 515 l. However, some equipment specifications result in a reduction in the luggage compartment capacity.

Bayerische Motorenwerke Aktiengesellschaft
Qualifizierung und Training
Röntgenstraße 7
85716 Unterschleißheim, Germany